

The newswweekly of enterprise network computing

NetworkWorld



Microsoft has been spending billions to further its 'Net appliance strategy.

Page 8.

May 24, 1999 Volume 16, Number 21

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SECRETS of the EC STARS



Learn what makes the Web's biggest commerce sites click.

BY ELLEN MESSMER

The *National Enquirer* and *Hard Copy* spend millions trying to unearth secrets of the Hollywood stars. We at *Network World* turned our attention, but fortunately not our wallets, toward the high-profile world of electronic commerce.

While details of Julia Roberts' love life may not improve your job, the secrets revealed by our industry's biggest e-commerce stars can help your company make more money. Who

knows? If you apply these lessons properly, maybe someday you'll be an e-commerce star, too.

Internet Entertainment Group: Try anything

Hop onto Seth Warshavsky's popular pornography site, and you'll soon be hit with an in-your-face Web advertisement for Viagra, See Stars, page 68

NETWORK WORLD SURVEY SAYS . . .

VCs still nuts about nets

BY CHRIS NERNEY

Another quarter, another network funding milestone.

Since superlatives are no longer adequate to describe the torrent of venture capital flooding into network start-ups, here are the dry facts:

Nearly 300 network companies received \$2.38 billion in See **Venture capital**, page 10

More **Online**

- A database with 18 months' worth of data from Price-waterhouseCoopers/Network World Venture Capital Surveys.



www.nwfusion.com

Tivoli seeks interoperability for mgmt. tools

BY JEFF CARUSO

NASHVILLE — The conference may have been called "Planet Tivoli," but the host company emphasized that its NetView net management system cannot exist in its own little world.

Tivoli revealed plans to its 1,800 guests to improve NetView by adding policy, Web and Common Information Model (CIM) capabilities that will enable the software to work better with other management systems.

Tivoli, which is owned by See **Tivoli**, page 14

Global Crossing ropes US WEST

Can \$37 billion deal boost upstart carrier's status?

BY TIM GREENE AND DAVID ROHDE

HAMILTON, BERMUDA — Global Crossing wants to make the hyperspace leap from relative obscurity up to the ranks of MCI WorldCom and AT&T — but the company may be playing out of its league.

With its recent transactions — including last week's \$37 billion deal to merge with US WEST and the proposed \$11.2 billion merger with Frontier Communications in March — Global Crossing is looking to graduate from being a simple wholesaler of international bandwidth to becoming a broadband retail telecom carrier.

If these proposed deals go through, Global Crossing will be able to offer its wholesale bandwidth to other carriers, sell long-distance voice and data services over Frontier's backbone, and expand the market for US WEST's



"This gives us products and services that we now can export around the world."

Robert Annunziata, CEO, Global Crossing

network-based services.

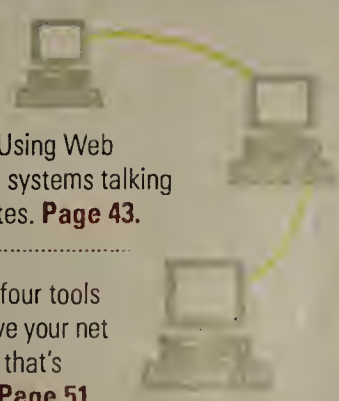
That potential clout intrigues some users. Global Crossing could possibly provide voice and data services internationally without the hassle of dealing with multiple See **Global Crossing**, page 12

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Building the management intranet: Using Web technology to get your net management systems talking to one another and to vendor support sites. **Page 43.**



Review: Our test of four tools that help you test-drive your net designs turns up one that's World Class — MIL 3's IT DecisionGuru. **Page 51.**



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THIS WEEK ONLINE



Cable-seeking back-hoes. Last week, Fred McClimans took MCI WorldCom to task for the way it handled (or

didn't) a cable cut in northern Virginia. Readers took up the cause of redundancy and backup, with one telling McClimans he should practice what he preaches. "I do," McClimans replied, explaining just how his firm prepared for a carrier outage. **DocFinder: 3037**

Operating systems. Missed our Operating System Showdown at the recent NetWorld+Interop 99 in Las Vegas, or just want to relive it? We've got the transcript online. **DocFinder: 3030**

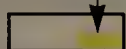
Linux vs. NT. Speaking of operating systems, as you might expect, our review last week comparing Caldera's OpenLinux with Microsoft's Windows NT elicited more than a few comments, some even printable. We heard from people who think Linux rules, people who think NT rules and people who wonder why we didn't include NetWare. See what they all say, and throw in your 2 cents. **DocFinder: 3036**

Relay spamming. Relay forwarding of e-mail has gotten a dirty name as a spammer tool, but some people still use it for legitimate reasons. See what those are, and join the overall debate on dealing with spam. **DocFinder: 3038**

Load balancers. Have you recently solicited bids for load balancers? If so, would you mind sharing your request for proposal (RFP) with us? The link below will get you to information about our RFP Central service and give you examples from our virtual private network and remote access server buyer's guides. **DocFinder: 2940**

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.



NetworkWorld

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DESKTOP Y2K PROBLEMS

There's no quick fix for Y2K on PCs. Tools and procedures give you a grip. Page 34.

HOW TO CONTACT US

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REVIEW: Our test of four tools that help you test-drive your net designs turns up one that's World Class — MIL 3's IT DecisionGuru. **Page 51.**

COOL TOOLS: Proxim's Symphony wireless home network line is music to the ears. **Page 53.**

NEWS BRIEFS, MAY 24, 1999

Last-mile battles loom

The chairman of the Federal Communications Commission has thrown a possible roadblock in front of ISPs that want to offer inexpensive broadband access. FCC Chairman William Kennard says cable TV operators shouldn't be forced to share their networks with ISPs that want to use existing cable nets to provide broadband Internet access to telecommuters and branch offices.



FCC's Kennard says cable TV and ISPs don't have to share their networks

Sprint's overseas partners at war

Sprint's two principal overseas partners are heading to court to settle an increasingly bitter dispute that threatens the stability of Sprint's global telecommunications alliance, Global One. France Telecom (FT) last week sued Germany's Deutsche Telekom (DT), claiming that the German carrier's proposed merger with yet another European carrier, Telecom Italia, violates the FT-DT partnership. Analysts say the lawsuit and the proposed Telecom Italia merger are the latest signs that DT and FT want out of the money-losing Global One venture.

Whopper, fries and a high-speed 'Net connection to go, please

Burger King isn't just for Whoppers anymore. The fast-food behemoth is opening a franchise that will offer up to 20 Internet surfing stations and a Webcam where surfers can call up Hartford, Conn.'s Burger King Web site and see a live transmission of restaurant activities. But don't get too excited. Customers buying Burger King combo meals will be allowed only 15 minutes of "filtered" Web surfing. That means no adult content and no e-mail.

Microsoft, Compaq and Xerox: The paperless office redux

Xerox and Microsoft last week said they are teaming up in what amounts to the latest push for the paperless office. The companies plan to integrate Xerox Document Centre, a host of machines for scanning, faxing and printing, with Microsoft Exchange Server. Under the plan, users would be able to scan documents directly into Exchange and share them with workgroups or replicate them to Exchange Public Folders.

Xerox also said Compaq signed an agreement to let Compaq's Work Expedito tool manage documents created with Document Centre and connect to Microsoft software.

The wired Palm

3Com this week is expected to announce the first wireless version of its PalmPilot. The Palm VII will let users connect to the Internet using BellSouth's wireless data network, which covers most big U.S. cities.

Netscape opens up new browser

America Online's Netscape division last week rolled out Version 4.6 of its Communicator browser.

Available from America Online's Web site, Communicator 4.6 includes 56-bit encryption algorithm support, improved digital certificate management, connections to Netscape's Open Directory technology, a smart-browsing feature for finding local information and a copy of Real Networks' G2 player.

Browser battle ends with a whimper

Speaking of Netscape, it seems that the ugly battle for dominance in the browser marketplace finally has a clear winner. According to a recent study from Zona Research, Microsoft's Internet Explorer has a 59% share of the enterprise network marketplace, while Netscape Navigator commands a 41% share.

The last study, which was conducted in October 1998, showed Navigator with a 20 percentage point lead on Microsoft's browser.

Bell Atlantic/GTE take one step closer to merger

Bell Atlantic and GTE are now at the mercy of the FCC and state regulators for permission to merge. Last week, both companies' shareholders overwhelmingly approved the \$52.8 billion deal that would create a powerhouse carrier with local networks in the lucrative Northeast and extensive wireless, long-distance and international holdings.

NOS Showdown redux

Don't fret if you missed the heated debate between the top five network operating system vendors at the recent Network World Operating System Showdown in Las Vegas.

You can now catch the blow-by-blow banter in the written transcript posted on Network World Fusion www.nwfusion.com, DocFinder: 3030.



For late-breaking news and more on these stories, see www.nwfusion.com.

More application-hosting services hit the street

BY DENISE PAPPALARDO

Qwest and Interpath Communications are introducing new application-hosting services that let business users offload the management, maintenance and monitoring of high-end enterprise applications.

The new services will let customers rent applications without having to deploy the software, servers or the additional IT staff to support the new applications.

Qwest's and Interpath's announcements last week come on the heels of several other application service provider (ASP) initiatives introduced earlier this month from Sprint, US WEST and others (NW, May 17, page 14).

Qwest announced last week that it plans to offer business users hosted Siebel Systems sales force automation software called Siebel Sales for Workgroups. The service lets business users set up their sales groups on secure hosted servers in one of Qwest's data centers. The servers can be accessed through a dedicated or dial-up Internet access connection.

The standard Siebel service has a customer's applications hosted on Hewlett-Packard servers, but Qwest will support other servers per customer request, says Lewis Wilks, president of Internet and multimedia markets at Qwest.

Today, Qwest has three data centers that will support 24-7 network, application and server monitoring for the company's application-hosting customers. Each of the data centers has at least one OC-48 dedicated Internet connection. Wilks says that Qwest will have 10 data centers operational by year-end to support its application-hosting customers.

Pricing is not yet available for Qwest's hosted Siebel application services. However, Wilks says Qwest's hosted SAP financial applications will cost \$150 to \$250 per month, per user.

Users also need to keep in mind that this price does not include Internet access to the

applications, warns Steve Murry, an analyst with International Data Corp., a consulting firm in Framingham, Mass. And users may find that they need to beef up their bandwidth when outsourcing their enterprise applications.

"Many of these applications were not designed for WAN access, so users may find that a 56K modem won't cut it," Murry says.

Interpath, a regional ASP in the Southeast, is also jumping on the SAP application-hosting bandwagon. Interpath is teaming with the software compa-

More Online

- A collection of columns by analysts Daniel Briere and Christine Heckart on emerging ASPs and what to consider before signing up with one.
- Service and product details from Qwest, Siebel and Interpath.

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ny and Sun to bring Interpath's services to market.

SAP Accelerated Financials is the first application that Interpath will be offering business customers sometime in the third quarter. Interpath customer's SAP applications will be hosted on shared Sun Solaris Enterprise servers and Sun StorEdge storage systems. Interpath is providing 24-7 management and monitoring from its Research Triangle Park, N.C., network operations center.

Interpath also plans on rolling out an SAP Accelerated Human Resources application-hosting service by year-end. But users will have to wait to find out how much both SAP services will cost, because pricing is not available.

Interpath's services will be available only to business users in North Carolina, South Carolina, Georgia, Tennessee and Virginia.

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Microsoft appliance plan could have enterprise impact

BY JOHN FONTANA

REDMOND, WASH. — With the speed of a day trader, Microsoft is investing billions of dollars in a consumer-focused strategy that is likely to spawn benefits for corporate nets.

Over the past several months, Microsoft has been throwing some of its \$20 billion cash reserve at the market for Internet appliances — stand-alone devices that connect to the Internet over broadband or wireless links. The company's investments have largely focused on the carriers and cable TV service companies, such as AT&T, providing the Internet access (see graphic).

Microsoft expects that its role in the Internet appliance

market will be to deliver software, including operating systems and applications such as microbrowsers that run on the devices.

While Microsoft's Internet appliance bent is decidedly consumer, enterprise customers may eventually use the devices, or the technology within them, to create access points to corporate networks.

The appliances include cable set-top boxes, wireless phones and single-purpose hardware devices that run a small-footprint operating system. In a corporate environment, appliances are likely to be used for highly focused computing needs, such as those in sales or manufacturing, or for remote access from devices such as Web TVs.

The intersection with the enterprise occurs where these appliances can "fit in specific areas — point of sale, kiosks [for service businesses], the factory floor in manufacturing and the warehouse," says Rick Villars, an analyst with International Data Corp. (IDC) in Framingham, Mass.

The feeling is that these devices won't replace the corporate desktop but will give users a multitude of ways to access applications. With some of that access over broadband, the possibilities are endless.

"Generally, broadband should spawn a base of services from remote application hosting to pervasive multicast and even increase the penetration of data and videoconferencing," says Rob Enderle, an analyst

Spending spree

Microsoft has been on a spending spree in the cable and wireless industry. The company figures these investments will better position its software for use in cable set-top boxes, Web phones and other devices that need Internet access. Here is a look at some of Microsoft's recent investments and acquisitions.

Company	Industry	Deal
AT&T	Telecom, cable	\$5 billion investment
TeleWest	Telecom, cable	Share trade to acquire 30% of firm
Nextel	Wireless	\$600 million investment
Sendit	Wireless	\$120 million acquisition
NTL	Cable	\$500 million investment
UPC	Cable	\$300 million investment

with Giga Information Group.

To stake its claim, Microsoft must sell its lightweight CE and Windows NT Embedded operating systems to a market also considering Sun's Java and Jini, as well as other platforms.

"CE needs to become more lightweight, more real time," says Jon Oltsik, an analyst with Common Sense Advisory. "Microsoft can do that with development, but another way is to throw money at the problem by getting a foothold with companies like AT&T."

IDC estimates that in 2002 there will be 28 million consumer Internet appliances as compared with 16 million consumer PCs. Today, IDC says, there are two million Internet appliances and nearly 11 million PCs.

"Microsoft believes, as we do, that there is a world going on beyond PC access to the Internet, and that world is information appliances," says Sean Kaldor, vice president of developing markets and technologies for IDC.

To underscore its commitment, Microsoft invested \$5 billion in AT&T earlier this month in order to guarantee that its Windows CE operating system would wind up in no less than 7.5 million AT&T set-top boxes that support interactive TV.

Alan Yates, director of Microsoft's WebTV platform marketing, says that although enterprise opportunities based on recent investments are clearly futuristic, "It is quite possible we would grow the relationship with AT&T [to include the enterprise] around

broadband services."

And now Microsoft may add a \$4 billion stake in Cable & Wireless, Britain's largest cable operator, and a \$1 billion investment in Germany's Deutsche Telekom, according to published reports.

Microsoft would not comment on the two reports, but all the recent activity is part of the company's strategy to push computing past the Windows-centric PC world.

While Microsoft's investment in cable and wireless firms ensures that the Redmond, Wash., company will have a piece of the appliance market, it also fosters ties with companies that may one day enter the emerging application-hosting market.

"Clearly, part of the Microsoft strategy is to form relationships with big carriers that may become application service providers. Microsoft will be well-positioned to supply hosted applications and the infrastructure they sit on," says Dwight Davis, an analyst with Summit Strategy.

ASPs intend to provide network administrators with the option of renting hosted applications instead of buying, deploying and managing them on their own nets. A host of companies, including AT&T, Cisco and IBM, introduced the Application Service Provider Industry Consortium two weeks ago at NetWorld+Interop 99.

"Microsoft is doing its damndest to make sure that it has a seat at the table for these emerging markets," says Jim Balderston, an analyst with Zona Research. ■

WebDefender 2.0 protects intranets

BY ELLEN MESSMER

ROCKVILLE, MD. — As organizations grant more business partners access to their intranets, so grows the problem of restricting access to sensitive data.

Axent Technologies is taking a swing at this problem with WebDefender 2.0, the latest version of the company's server software for checking user identity through static or dynamic passwords.

WebDefender now works not just with Microsoft's Web server, but with any Web server. And the product no longer uses a proprietary database to store user permissions, but can make use of Lightweight Directory Access Protocol (LDAP) directories where this data may already be stored.

LDAP a plus

"It's real nice," says Geoff Meek, Web site applications manager at Open Market,

which has deployed WebDefender as the single point where customers log on to use Open Market's set of extranet applications for order processing or discussion forums.

"The advantage of the LDAP support is that there are other applications that use it, too, for storing user data," Meek says.

In addition, the latest version of WebDefender can accomplish single sign-on access for multiple NT or Unix servers through a component called SecureLink Bridge for

Unix. "One machine is acting as the protector for all the other machines," Meek points out.

Axent Product Manager Vic Demarines says that in a mixed NT and Unix environment, SecureLink Bridge plays the role of a proxy server so that the user seeking Web access always gets directed to this central authentication point on the network.

WebDefender costs between \$5,000 and \$35,000, depending on the number of Web servers.

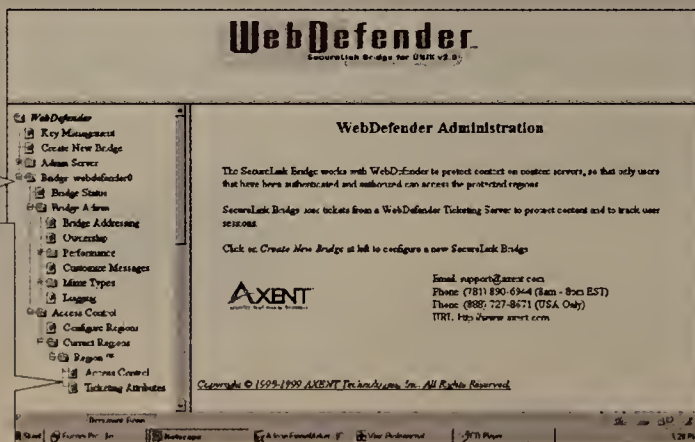
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Axent's WebDefender 2.0 server software lets administrators establish extranet access for employees and trading partners.

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Vendors sing praises at Linux love fest

BY ROBIN SCHREIER HOHMAN

RALEIGH, N.C. — You know a system has arrived when shows devoted to it pop up. In the case of Linux, a whole rash of shows are up and running, including last week's LinuxExpo.

At the gathering, a couple of big names showed up and heralded their support for the open source operating system.

Novell announced that it expects to port its Novell Directory Services (NDS) to Linux by year-end. Although Novell said in October that it was working with Linux distributor Caldera Systems on NDS, that's no longer the case.

The Novell version of NDS for Linux will allow NDS to run on the Linux operating system. Meanwhile, Caldera is working on allowing NDS to control Linux applications.

"We found that people aren't as interested in having NDS run on the platform as they are in having Linux be administered by NDS," says Ransom Love, CEO of Caldera.

Not to be outdone, Oracle announced that it will port the Oracle8i Lite database to Linux, and introduce an embeddable version that will

support up to 10 users simultaneously.

Not all the announcements at the show were from the big guns. Linux start-up Zenguin — a play on the word penguin, the Linux mascot — unveiled its new installer application, an effort to make it easier to load applications onto any version of Linux.

Even when distributions use the same Linux kernel, the files may be organized in different ways, and they may use different file libraries. That makes it harder to ensure third-party software will run properly. The Zenguin Installer for Applications will be free for open source developers, and sold to software vendors.

Linuxcare, a Linux support firm, launched its certification program at the show. Working with Linuxcare's Labs division, vendors will be able to submit hardware to be certified to run Linux. Linuxcare will test the hardware with the latest Linux kernel and the most common distributions of Linux. If the hardware can perform at full functionality running the kernel and each distribution, it will get the "Linuxcare Labs Certified" mark, says David LaDuke, vice president of marketing and a co-founder.

For the hardware to be certified, Linuxcare Labs must be able to install Linux without taking any special action, he says. Most of the problems people encounter when installing Linux come from incompatible drivers for peripherals, LaDuke says. Linuxcare's Web site includes a knowledge database that has information about what drivers are known to work with sound cards, video cards and other peripherals.

Linuxcare, which began in August 1998, provides multiple levels of support for Linux, from one-time phone support to 24-7 on-site support. ■

Venture capital,
continued from page 1

venture funding in the first quarter, according to the ninth quarterly PricewaterhouseCoopers/Network World Venture Capital Survey. PricewaterhouseCoopers conducts a broad venture capital survey every quarter and breaks out network industry numbers exclusively for *Network World*.

That dollar amount of network funding during Q1 was 45% above the previous record of \$1.64 billion set in the third quarter of 1998.

It's also more than double the \$917 million in network industry investments in Q1 '98, and roughly quadruple the \$588 million recorded in Q1 '97, the first quarter tracked in the joint survey.

And here's a scary thought: In the past two years, the first quarter has trailed all others in total network industry venture dollars. If that holds true this year, then 1998's all-time high of \$5.25 billion could be eclipsed by mid-year.

Networking means 'Net

More than ever before, the Internet is the driving force behind network industry investments. Of the 294 network companies drawing venture funding in the first quarter, 72% were Internet start-ups, compared to 61% in Q1 '97, when the first survey was conducted. And unlike two years ago, when many venture capitalists were shying away from Internet "pure plays," the vast majority of Internet companies receiving funding in the recent quarter are nothing but 'Net.

For IT professionals, these figures indicate that the assimilation of Internet technology by the network universe is rapidly becoming complete.

"What you're seeing is a product of the convergence and interdependence of traditional networking technology and the Internet," says Kirk Walden, national director of venture capital research for PricewaterhouseCoopers.

The proliferation of companies providing Internet-based services means growing challenges in terms of managing network resources, and growing employment opportunities as the number and size of networks continue to increase.

Electronic commerce com-

panies in particular were popular among investors, with 72 grabbing funds.

"Clearly everyone is trying to back the next eBay," says Tim Barrows, a general partner at Matrix Partners in Waltham, Mass. "We're all trying to stake out territory in the e-commerce space."

E-commerce start-ups receiving funding ranged from vendors of transactional processing services, such as Internet Commerce Services of Nashua, N.H. (\$7 million), to dozens of online retailers.

And the deals keep getting larger as well (see graphic). Among the top money magnets in Q1 were:

- Wit Capital Group, which raised \$72 million in a second round of funding. Wit, an online investment broker, is using the money to prepare for a pending initial public offering of stock.
- InterNAP Network Services, which landed \$32 million

growing is the importance to companies of getting to and owning a market first."

Niche players abound — evidence that the Internet economy continues to fill out. E-Steel, for example, runs a Web site that brings together buyers and sellers in the global steel industry. The New York-based company raised \$3.5 million in first-round funding.

Another niche vendor, iPrint of Redwood City, Calif. (\$7.5 million), designs e-commerce software to automate mass-market custom printing over the Web.

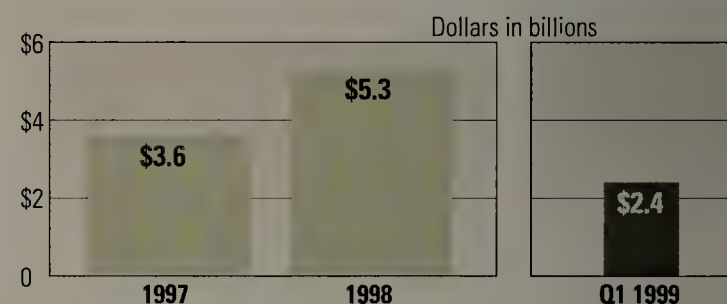
Net gear and net management

While in a minority, there were a number of venture deals involving network equipment vendors and providers of network management services and software. Among them were:

- Avici Systems of North Billerica, Mass. (\$4.3 million), which sells high-performance

A record pace

Based on Q1 investments, it looks as though this could be a record year for venture capital funding in the network industry.



SOURCE: PRICEWATERHOUSECOOPERS/NETWORK WORLD QUARTERLY VENTURE CAPITAL SURVEY

in Q1. The company says it has developed a series of private network access points that connect to all major Internet backbones and avoid sending data through the "chokepoints" of the public 'Net. InterNAP targets high-volume online retailers, enterprises and ISPs.

• Accelerated Networks, which received \$30 million in a "follow-on" round of funding. The company makes access devices for the customer premises that integrate multiple traffic types over a single line.

Barrows says there are two reasons that venture deals in excess of \$20 million or so are becoming more common.

"For one thing, there's a tremendous amount of venture capital available," he says. "The other reason the deals are

backbone routers and switches.

• Efficient Networks of Dallas (\$2.1 million), which designs ATM and asymmetric digital subscriber line adapter cards.

• Tavve Software of Durham, N.C. (\$1 million), which makes network management reporting software.

A handful of companies offering telephony products and services received funding in Q1. These include PakNetX of Salem, N.H. (\$5.1 million), a seller of Internet-based multimedia call centers, and carrier Internet Telephony Exchange of Princeton, N.J., which got a second-round deal totaling \$15 million.

Nerney is a senior analyst at Internet.com, a Web site for Internet professionals.

Corrections

In a recent story (NW, May 3, page 19), the photo caption for Larscom's TerraBoss should have stated that the DSU handles single T-1 lines, not multiple T-1 lines.

A recent story (NW, May 17, page 12) incorrectly stated the price of Novell's BranchManager for NT software. The suite costs about \$1,000 per NetWare server.

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Global Crossing, continued from page 1

foreign carriers, says Thomas Magee, network operations manager for Mentor Graphics in Wilsonville, Ore., which has sites in the

U.S., Europe and Asia.

Dealing with multiple local carriers in the U.S. and overseas is complicated. And giving all the company's business to one carrier could reap volume discounts, he says.

Indeed, Magee's ideas play

into US WEST's vision of future public nets. Carriers will need a complete set of broadband access, high-capacity fiber core networks, international offerings and a set of services that goes beyond simple network transport, according to Joe Zell, president of US WEST's data network division, !nterprise.

None of the major carriers — WorldCom, Level 3, Qwest and AT&T — has all those elements today, but Global Crossing will have the potential to offer them, Zell says. And Global Crossing could acquire even more networks.

"I think we have a tremendous scope, but if we see

Global Crossing says it will sell US WEST digital subscriber lines for broadband local access services as well as frame relay and ATM packages in other regions. Global Crossing executives say they will use the company's national and international fiber nets to deliver Web hosting services and network-based application services developed by US WEST's !nterprise. "What my team has built for our region becomes widely extensible," Zell says.

Despite its self-portrayal as a data carrier, US WEST still gets 90% of its income from voice customers, Haller notes.

But that doesn't mean the

permission yet.

Global Crossing can find plenty of other customers outside US WEST territory even if the FCC doesn't grant long-distance permission, according to analyst Ayvazian. "Who cares?" he says. "How many multinational companies are located in the US WEST region?"

But current Frontier customers worry that the merger could affect current service.

"Our concern [with the merger] is going to be continuity," says Enrique Arrata, senior vice president of MIS for Sunglass Hut International in Coral Gables, Fla.

Frontier does a more effective



The Scoop The news behind the news

BELLSOUTH GOES IT ALONE

So what's with BellSouth?

The company is the only regional Bell operating company that has not bought another carrier or been bought since the Telecommunications Act of 1996.

Instead, BellSouth has focused on marketing more advanced services to its current customers in nine Southern states. And the RBOC has made an alliance with long-distance carrier Qwest.

BellSouth's ultimate goal — like other RBOCs — is to get permission from the Federal Communications Commission to sell long-distance services and then go national. But the strategy isn't strictly about voice.



BellSouth CEO Duane Ackerman says his company's strategy is "all about data."

"It's all about data," says Duane Ackerman, chairman and CEO of BellSouth.

Among the services BellSouth wants to offer more widely: high-speed network services such as frame relay, ATM and IP; and advanced applications, including Web hosting, electronic commerce, video streaming, managed network services, managed software services and virtual private network services.

Some observers say BellSouth cannot survive alone, but company executives say they have no plans to buy or sell the company.

Still, rumors persist that BellSouth might be interested in merging with Qwest or long-distance carrier Sprint. So far, there has been no public link between BellSouth and Sprint, but that is not the case with Qwest: BellSouth has a 10%, \$3.5 billion investment in the No. 4 carrier (NW, April 26, page 31). Under that arrangement, BellSouth and Qwest agree to refer customers to each other.

Federal regulations prohibit BellSouth from selling long-distance services directly until the carrier can meet federal requirements, including the need to demonstrate that local phone competition exists in its region. Once that happens, the current agreement with Qwest will evolve into joint service marketing. The carriers will also develop services together and link their ordering systems.

Spending money to develop advanced services rather than to acquire more networks may be the way to go. Instead of building its own networks, BellSouth could buy inexpensive bandwidth from wholesale carriers that are building high-capacity fiber nets, says Robert Rosenberg, president of Insight Research, a telecom analysis firm in Parsippany, N.J.

"Put that money you spent on buying facilities into remaking the company from a telecommunications entity into a marketing and sales dynamo," he says. "You're not in the telephone industry anymore, you're in a data transport business."

— Tim Greene

Global Crossing's piece parts

When Global Crossing absorbs Frontier and US WEST, it will control a variety of local, long-distance and international networks. The challenge will be making the unique assets of each add up to a single, cohesive service provider. The following is a breakdown of what each company involved has to offer:



- Local networks in 13 states in the South and Midwest
- National fiber network
- One million phone customers



Global Crossing

- Undersea fiber to South America, Europe and Japan
- Fiber networks in South America, Europe and Japan



- 16 million phone customers
- Broadband data services
- Wireless services
- Web hosting and application services

something along the way that makes sense, I wouldn't rule out us doing another acquisition," says Global Crossing CEO Robert Annunziata.

However, standing in the way of that rhetoric is the fact that Global Crossing's own net is still under construction, and the absorption of US WEST and Frontier won't be complete until sometime toward the end of 2000. Those factors make Global Crossing's claim to membership in the carrier elite a bit premature, analysts say.

"I think it's ludicrous for Global Crossing to claim they will be able to compete with AT&T and MCI WorldCom," says J.B. Haller, director of network and Internet research for Current Analysis in Sterling, Va. "AT&T and MCI WorldCom have existing infrastructure and customers in far-away places." Even when Global Crossing's network is complete, the company will still have an uphill battle, according to Robert Rosenberg, president of Insight Research in Parsippany, N.J. "You're fighting in a sandbox with AT&T, British Telecom and an awful lot of very experienced providers," he says.

merger can't be successful, according to Berge Ayvazian, senior vice president of The Yankee Group.

For example, Frontier has built up a healthy business by taking over local and long-distance operations for retail chains. Key to those deals: Unlike many other competitive local exchange carriers, Frontier has no reluctance to simply resell regional Bell operating company lines in areas where it doesn't have its own local nets.

That makes Frontier a single national contact for companies that want to buy local phone service in more than one RBOC region. While Frontier slightly undercuts RBOC prices, that can add up to substantial customer savings over thousands of locations.

One sticking point is that even though US WEST brings 16 million customers to Global Crossing, Global Crossing would not be able to sell long-distance services in the US WEST region — which includes 14 Western states. Before that can happen, US WEST needs permission from the Federal Communications Commission, and it has not even asked for

tive job of hustling to install lines than the biggest local and long-distance carriers, he says. That's important to Arrata because Sunglass Hut's business plan includes rapid expansion to new sites. ■

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For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2467 in the DocFinder box.

This week's question:

International carrier Global Crossing plans to merge with Denver-based US WEST in a multibillion dollar deal. Where is Global Crossing's home?

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Tivoli,
continued from page 1

IBM, also said it will deliver a version of its Tivoli Manager systems management product that runs on IBM mainframes.

The NetView product upgrades, which will appear over the next 12 months, should better position Tivoli's software vs. the plethora of new management tools that have rolled out in recent months from established players and newcomers.

Tivoli will ensure that NetView, as well as the company's systems management tools, can easily swap data with other management tools by supporting CIM, an emerging Distributed Management Task Force standard for information exchange.

It will be easier to get third-party vendors to integrate their products with Tivoli tools via the emerging standard

than to get them to write to NetView's proprietary APIs, says Leo Cole, director of network management at Tivoli.

CIM will also give Tivoli a way to further integrate its own products, bringing together data from NetView and Tivoli's systems management tools. Rival Hewlett-Packard is using CIM in a similar fashion for its management tools (NW, April 19, page 1).

Tivoli also has plans to forge tighter links between NetView and other vendors' policy management servers.

Policy-based management is an emerging concept where managers determine which applications or users get access to network bandwidth and other resources, and these decisions are enforced in network hardware. But Cole says policy management is headed in the wrong direction.

"The way policy-based management is positioned today is

a train wreck waiting to happen" because all the policy servers that have been announced are aimed at the network operations center, Cole says. The people in the network operations center are not the people who should make decisions about which applications and departments get top priority, he says.

NetView won't communicate policies directly to network devices. Instead, managers responsible for applications will be able to set policies through Tivoli software and pass them on to various policy servers in network operations centers. "We will allow you to gain control over what is going to be chaos in the policy management market," Cole says.

Tivoli also discussed the next distributed version of NetView, due out at year-end. This version will be able to more flexibly and accurately discover a network topology and show the status of the devices within that topology.

Because NetView currently isn't able to account for geography or importance of certain devices when it performs autodiscovery, many large users enter their network topologies by hand, says Jim Carey, development manager for the distributed version of NetView. The next NetView version will let users build a text file detailing where certain address ranges are physically located. NetView will examine the file as it builds a network topology map.

The new version will also use SNMP polling in addition to ping to find out the status of network devices. The ping utility is limited because it will show devices as being in critical condition if it can't route to them. Using SNMP requests, NetView can display the true status of the devices, Carey says.

NetView will also be getting a new interface that can launch Web-based management interfaces embedded in many network devices today.

This feature appeals to Bengt-Olof Bloom, a network engineer with the Swedish bank SEB, who now manages devices separately through their Web interfaces. "This might be a way to get a focal point," he says.

Tivoli also promised to improve its management for

ATM networks, though few details were available. Bloom said such a move is overdue. He pointed out that IBM has a separate management system



Tivoli's Leo Cole is aiming to eliminate policy management chaos.

for ATM and that he would like to see that system integrated with NetView.

On the systems management side, Tivoli is preparing Tivoli Manager on OS/390, says Martin Neath, executive vice president at Tivoli. Today, Tivoli has an agent available to manage mainframes along with the rest of an enterprise, but the software to be announced next month will make it possible to use the mainframe as the Tivoli server to manage an enterprise.

Tivoli is bringing its management framework to the OS/390 platform so that network managers can run software distribution, inventory, security and systems monitoring from there. The Manager software will collect information about applications on the mainframe to determine how outages might affect certain applications, to display the resources used by a business process and to help track down problems. Tivoli is licensing some of the code to create the product under an OEM arrangement with Accessible Software, Neath says. ■

For more Planet Tivoli news, including IBM CEO Lou Gerstner's take on Tivoli and customers' experiences with Tivoli software, go to www.nwfusion.com, DocFinder: 3035.

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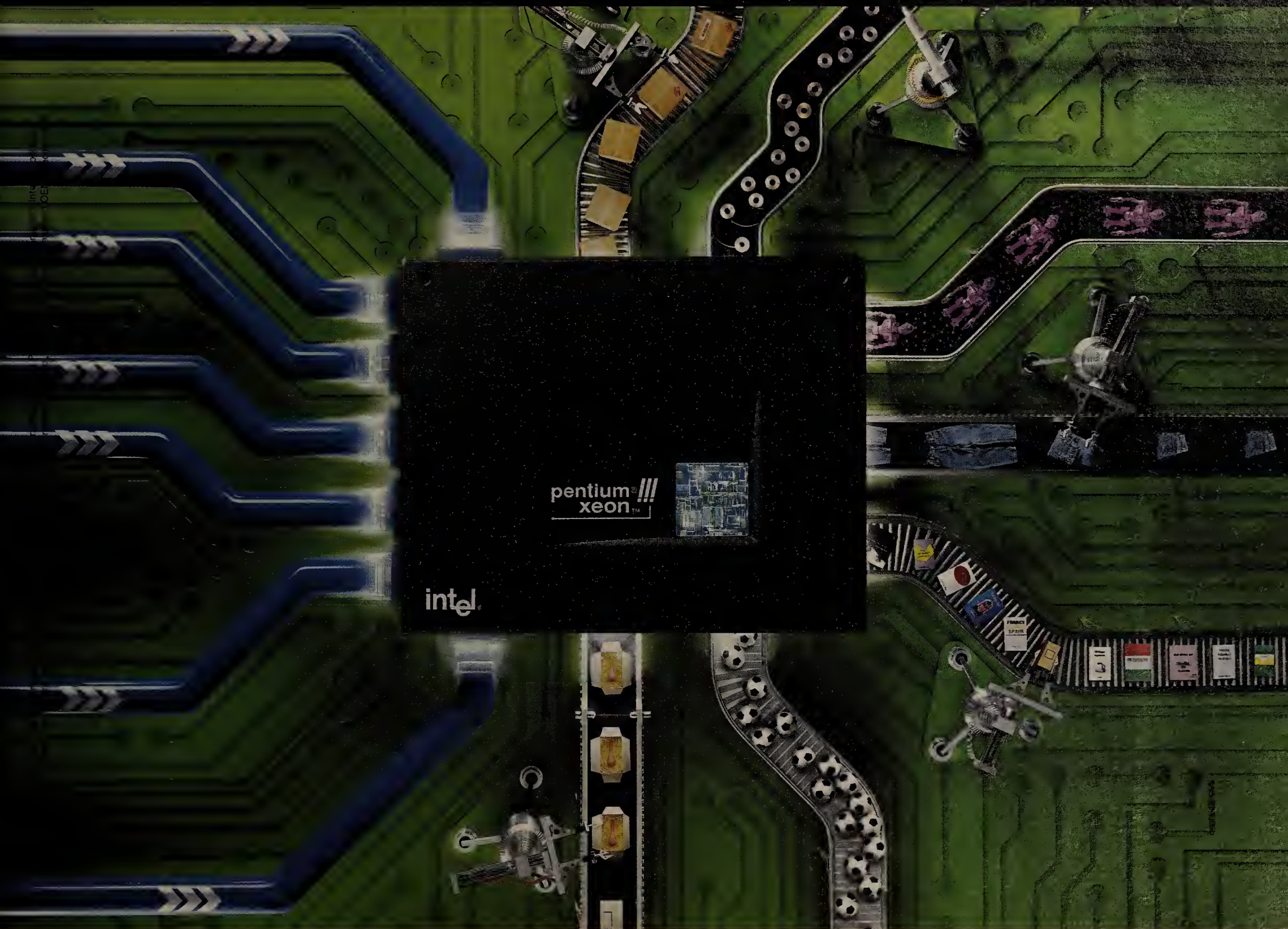
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2. Favorite book of all time
3. Favorite after-dinner activity
4. Our greatest president (Chester A. Arthur acceptable)
5. Cats or dogs?

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1. What is the principal business activity at your location?

(check ONE only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable /Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities

10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)

18. ☐ Manufacturing (Computer/Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/Communications)*
22. ☐ Other (please specify)

* Please complete form based on largest client.

2. What is your job function?

(check ONE only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management

4. ☐ IS/IT/MIS/CIO/Systems Management
5. ☐ Internet/Intranet/Electronic Commerce Mgmt., Webmaster
6. ☐ Engineering Management

7. ☐ Corporate Management (CED, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other _____

3. What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code on the line next to each product category. Please complete ALL categories A-N.)

1. \$100 Million or more
2. \$50 Million to \$99.9 Million
3. \$25 Million to \$49.9 Million
4. \$10 to \$24.9 Million
5. \$1 to \$9.9 Million
6. \$100,000 to \$999,999
7. \$50,000 to \$99,999
8. Under \$50,000
9. None of the above

- A _____ Large Systems (Mainframes/Minis)
B _____ Desktops (Micros/Laptops/Workstations)
C _____ Servers
D _____ LANs
E _____ WAN Equipment
F _____ Carrier Services

- G _____ Internetworking
H _____ Internet
I _____ Intranet
J _____ Extranet
K _____ Remote Access
L _____ Peripherals
M _____ Software
N _____ Service/Support

4. What is the total number of sites for which you have purchase influence?

(check ONE only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5. What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (check ONE box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
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<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve

4. ☐ Evaluate
5. ☐ Determine the Need
6. ☐ None

7. What is the estimated number of employees at your location/in entire organization?

(check ONE in each section)

A. At your location:

1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999

5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 250 - 499
8. ☐ 249 or less

B. Entire organization:

1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999

5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

8.

Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

INTERNET/INTRANET

- A ☐ 01. ☐ Internet Services/Web Hosting
B ☐ 02. ☐ Firewalls/Security/Encryption
C ☐ 03. ☐ Web Servers/Software
D ☐ 04. ☐ Web Servers/Hardware
E ☐ 05. ☐ TCP/IP Software
F ☐ 06. ☐ Management/Monitoring Software

- A ☐ 07. ☐ Voice/Video Over IP
B ☐ 08. ☐ VPN Equipment/Services
C ☐ 09. ☐ Legacy Integration Tools (Web to Host)
D ☐ 10. ☐ Web Development Tools (JAVA, ActiveX, etc.)
E ☐ 11. ☐ Push Technology

- A ☐ 12. ☐ Web Browsers
B ☐ 13. ☐ Intranet Applications/Groupware
C ☐ 14. ☐ Search/Retrieval Products (web crawler)
D ☐ 15. ☐ Electronic Commerce Tools
E ☐ 16. ☐ Web Authoring Tools
F ☐ 17. ☐ Other _____

LOCAL-AREA NETWORKS/ INTERNETWORKING

- A ☐ 18. ☐ Local-Area Networks
B ☐ 19. ☐ Network Operating System Software
C ☐ 20. ☐ Servers
D ☐ 21. ☐ Print Servers
E ☐ 22. ☐ Routers
F ☐ 23. ☐ ATM Switches
G ☐ 24. ☐ Token-Ring Switches
H ☐ 25. ☐ Ethernet Switches
I ☐ 26. ☐ Fast Ethernet
J ☐ 27. ☐ Gigabit Ethernet

- A ☐ 28. ☐ Layer 3 Switches
B ☐ 29. ☐ Network Storage Devices (NAS, SANs)
C ☐ 30. ☐ LAN Storage/Backup
D ☐ 31. ☐ Optical Storage/Backup/Jukeboxes
E ☐ 32. ☐ Disk Storage/Backup
F ☐ 33. ☐ Tape Storage/Backup
G ☐ 34. ☐ RAID Storage/Backup
H ☐ 35. ☐ Network Test/Diagnostic Tools
I ☐ 36. ☐ Cables, Connectors, Baluns

- A ☐ 37. ☐ UPS
B ☐ 38. ☐ Network Interface Cards (NICs)
C ☐ 39. ☐ Hubs
D ☐ 40. ☐ Intelligent Hubs
E ☐ 41. ☐ Stackable Hubs
F ☐ 42. ☐ Bridge/Router
G ☐ 43. ☐ SNMP Network Management
H ☐ 44. ☐ Gateways
I ☐ 45. ☐ Concentrators/Repeaters
J ☐ 46. ☐ Other (please specify)

COMPUTERS/PERIPHERALS

- A ☐ 47. ☐ Thin Clients/Network Computers (NCs)
B ☐ 48. ☐ Laptops/Notebooks/Sub-Notebooks
C ☐ 49. ☐ Micros/PCs

- A ☐ 50. ☐ Minis
B ☐ 51. ☐ Mainframes
C ☐ 52. ☐ Workstations
D ☐ 53. ☐ Printers/Network Printers

- A ☐ 54. ☐ CO-ROM/DVO
B ☐ 55. ☐ Fax/Modem Boards
C ☐ 56. ☐ Memory/Chips/Boards/Cards
D ☐ 57. ☐ Other _____

REMOTE/WIRELESS COMPUTING

- A ☐ 58. ☐ Remote Access Products
B ☐ 59. ☐ Remote Access Services
C ☐ 60. ☐ PDAs

- A ☐ 61. ☐ PCMCIA Devices
B ☐ 62. ☐ Wireless Data Equipment/Services

- A ☐ 63. ☐ Cellular Equipment & Services
B ☐ 64. ☐ Other (please specify)

SOFTWARE/APPLICATIONS

- A ☐ 65. ☐ Network Management
B ☐ 66. ☐ Systems Management
C ☐ 67. ☐ Security
D ☐ 68. ☐ Communications Software
E ☐ 69. ☐ Terminal Emulation
F ☐ 70. ☐ Operating Systems
G ☐ 71. ☐ Applications Development Tools
H ☐ 72. ☐ Database Management/ RDBMS
I ☐ 73. ☐ Groupware
J ☐ 74. ☐ Workflow

- A ☐ 75. ☐ EDI
B ☐ 76. ☐ E-mail
C ☐ 77. ☐ Desktop Videoconferencing
D ☐ 78. ☐ Imaging
E ☐ 79. ☐ Suites/Server Suites (Back Office, etc.)
F ☐ 80. ☐ Middleware
G ☐ 81. ☐ Document Management
H ☐ 82. ☐ Site Metering Tools
I ☐ 83. ☐ Computer Telephony Integration (CTI)

- A ☐ 84. ☐ Data Warehousing
B ☐ 85. ☐ Anti Virus Software
C ☐ 86. ☐ Multimedia
D ☐ 87. ☐ Yr. 2000 Conversion Software (Y2K)
E ☐ 88. ☐ Helpdesk
F ☐ 89. ☐ Web Based Management Tools
G ☐ 90. ☐ Directory Services
H ☐ 91. ☐ Other (please specify)

WIDE-AREA NETWORK EQUIPMENT & SERVICES

- A ☐ 92. ☐ 56 Kbps Modems
B ☐ 93. ☐ Under 56 Kbps Modems
C ☐ 94. ☐ Cable Modems
D ☐ 95. ☐ Asynchronous Transfer Mode (ATM)
E ☐ 96. ☐ Frame Relay Equipment/Services
F ☐ 97. ☐ ISDN Equipment & Services
G ☐ 98. ☐ FT-1/T-1/T-3 Multiplexers/Services

- A ☐ 99. ☐ xDSL Services/Products
B ☐ 100. ☐ Diagnostic/Test Equipment
C ☐ 101. ☐ DSU/CSU
D ☐ 102. ☐ PBXs
E ☐ 103. ☐ Videoconferencing
F ☐ 104. ☐ Leased Lines
G ☐ 105. ☐ Switched Data
H ☐ 106. ☐ Virtual Private Networks (VPN)
I ☐ 107. ☐ FRAOs

- A ☐ 108. ☐ Managed LAN/Router Services
B ☐ 109. ☐ Other _____
C ☐ 110. ☐ Outsourcing/Systems Integration Services
D ☐ 111. ☐ Education/Training Services
E ☐ 112. ☐ None of the above (1-111)

9.

Please indicate the platforms that are currently installed/planned: (check ALL that apply)

A. Currently installed

B. Planned for purchase

NETWORK PROTOCOLS

- A ☐ 01. ☐ TCP/IP
B ☐ 02. ☐ IPv6
C ☐ 03. ☐ SNA

- A ☐ 04. ☐ Novell IPX/SPX
B ☐ 05. ☐ APPC/APPN/LU 6.2
C ☐ 06. ☐ NETBIOS

- A ☐ 07. ☐ NFS
B ☐ 08. ☐ SNMP
C ☐ 09. ☐ Other _____

LAN ENVIRONMENT

- A ☐ 10. ☐ Gigabit Ethernet
B ☐ 11. ☐ Switched Ethernet
C ☐ 12. ☐ Fast Ethernet (100 Megabit Ethernet)
D ☐ 13. ☐ Ethernet

- A ☐ 14. ☐ ATM
B ☐ 15. ☐ Token Ring/Token Ring Switching
C ☐ 16. ☐ IP Switching
D ☐ 17. ☐ Layer 3 Switching

- A ☐ 18. ☐ FDDI
B ☐ 19. ☐ 100Base-T
C ☐ 20. ☐ 10Base-T
D ☐ 21. ☐ Fibre Channel
E ☐ 22. ☐ Other _____

NETWORK OPERATING SYSTEM

- A ☐ 23. ☐ Windows NT
B ☐ 24. ☐ Windows NT/Advanced Server
C ☐ 25. ☐ Novell IntranetWare
D ☐ 26. ☐ Novell (NetWare 5.X)

- A ☐ 27. ☐ Novell (NetWare 4.X)
B ☐ 28. ☐ Novell (NetWare 2.X, 3.X)
C ☐ 29. ☐ Microsoft (LAN Manager)
D ☐ 30. ☐ Banyan (VINES)

- A ☐ 31. ☐ IBM (Server)
B ☐ 32. ☐ Other (please specify)

COMPUTER OPERATING SYSTEM

- A ☐ 33. ☐ NT Server
B ☐ 34. ☐ NT Workstation
C ☐ 35. ☐ Unix/Xenix/AIX/SCD
D ☐ 36. ☐ Solaris
E ☐ 37. ☐ Windows

- A ☐ 38. ☐ Windows 95
B ☐ 39. ☐ Windows 98, .9x
C ☐ 40. ☐ OOS
D ☐ 41. ☐ OS/2, DS/2 Warp
E ☐ 42. ☐ IBM MVS/VM/VSE

- A ☐ 43. ☐ Digital VMS
B ☐ 44. ☐ Macintosh
C ☐ 45. ☐ Other
D ☐ 46. ☐ None of the above (1-45)

10.

Which of the following Servers/Clients do you have installed/planned at your location?

(check ALL that apply in each column)

A. Servers		B. Clients		A. Servers		B. Clients	
Power PC	<input type="checkbox"/>	01. <input type="checkbox"/>		486, 386, 286	<input type="checkbox"/>	07. <input type="checkbox"/>	
Power Mac	<input type="checkbox"/>	02. <input type="checkbox"/>		Sun Sparc	<input type="checkbox"/>	08. <input type="checkbox"/>	
Mac Other	<input type="checkbox"/>	03. <input type="checkbox"/>		Risc	<input type="checkbox"/>	09. <input type="checkbox"/>	
Multiprocessor Servers	<input type="checkbox"/>	04. <input type="checkbox"/>		Alpha	<input type="checkbox"/>	10. <input type="checkbox"/>	
Pentium II (PII)	<input type="checkbox"/>	05. <input type="checkbox"/>		Other	<input type="checkbox"/>	11. <input type="checkbox"/>	
Pentium/Pentium Pro	<input type="checkbox"/>	06. <input type="checkbox"/>					

11.

Which of the following hardware platforms are installed/planned in your company?

(check ALL that apply)

A - Mainframes (Large Scale)

1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other _____

B - Minis (Midrange)

1. ☐ IBM RS/6000
2. ☐ IBM AS/400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other _____

C - Workstations

1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other _____

12.

What is the estimated gross revenue of your entire company/institution?

(check ONE only)

01. ☐ \$20 billion or more
02. ☐ \$10 billion to \$19.9 billion
03. ☐ \$1 billion to \$9.9 billion
04. ☐ \$500 million to \$999.9 million

05. ☐ \$100 million to \$499.9 million
06. ☐ \$50 million to \$99.9 million
07. ☐ \$10 million to \$49.9 million
08. ☐ \$5 million to \$9.9 million

09. ☐ \$4.9 million or less
10. ☐ None of the above

13.

For which areas outside of North America do you have purchase influence?

(check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

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Infrastructure

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Briefs

IBM has announced a Layer 3 workgroup switch capable of handling 9.5 million data packet/sec.

The 8275 Fast Ethernet Workgroup Switch Model 416 boasts 16 10/100M bit/sec ports and two expansion slots for Gigabit Ethernet or other



IBM's 8275 Model 416 switch can handle 9.5 million packet/sec.

interfaces. The device can function as a backbone or edge switch and can prioritize traffic based on quality-of-service parameters.

The 8275 Model 416 costs about \$145 per 10/100M bit/sec port and will be available next month.

IBM: (800) 426-4968

JNI has unveiled its latest PCI-to-Fibre Channel host bus adapters for storage-area networks.

The FibreStar cards operate at 2G bytes per second in workgroup and departmental Windows NT, Linux, Solaris and Macintosh LANs.

The cards, which come in 32- and 64-bit versions, connect servers to Fibre Channel storage devices, hubs or switches.

The adapters are bundled with JNI's EZ Fibre software, which simplifies installation and troubleshooting.

Both adapters have copper or fiber-optic connections and work in switched fabric or Fibre Channel Arbitrated Loop networks.

Available in July, the adapters are priced starting at about \$750.

JNI: (619) 535-3121

Office 2000: More than a desktop issue

Study shows that client choice, server tuning are key to rolling out Microsoft's new suite.

BY JOHN FONTANA

There is no doubt that Microsoft's Office 2000 will bring dramatic changes to the desktop when it ships next month, but network administrators also better prepare their network servers to support the suite's newest features.

Office 2000 requires a set of office server extensions (OSE) running on NT to support the suite's new document-sharing capabilities.

The extensions turn Office 2000 from a desktop tool into an intranet document-creation suite by letting users save files in HTML and post them to a Web server. From there, other users can read, edit or annotate the documents, or participate in online discussions embedded in the documents. The extensions create online Web-based file systems called Web folders that can be accessed using Office 2000 applications or a Web browser.

Because the collaboration features rely on a back-end infrastructure for their horsepower, network administrators will need to pay particular attention to server configurations and software on the desktop to ensure optimal performance when

Office 2000 hardware

Office 2000 will be most visible on corporate desktops, but to take advantage of the suite's collaboration features, network administrators had better evaluate their back-end systems. Here is a look at the hardware needed to run Office 2000 server extensions.

Server type	CPU	Memory	Number of users supported	Applications
Workgroup	Pentium Pro (single or dual)	128M bytes or more	100 (50 concurrent)	Small department or branch office document sharing and collaboration/discussion
Department	Pentium II/III (single or dual)	256M bytes or more	500 (250 concurrent)	Department or small business unit collaboration, group discussion and employee knowledge management
Enterprise	Pentium Xeon (dual or quad)	384M bytes or more	1,000 (500 concurrent)	Large business unit or enterprise knowledge management, forum discussions and help desk

SOURCE: COMPETITIVE SYSTEMS ANALYSIS, DANVILLE, CALIF.

deploying the extensions, according to a recent report by Competitive Systems Analysis (CSA).

And because Office 2000 introduces the Web browser as a client for the suite, the choice of browser software also raises issues that could play havoc with performance.

"The biggest question network administrators will have to ask is 'Do I have the capacity to handle the processing needs?'" says Randy Kennedy, director of research for CSA (see graphic).

Network administrators should pay close attention to tuning performance of See **Office 2000**, page 18

Phobos puts server load balancer on a card

BY ROBIN SCHREIER
HOHMAN

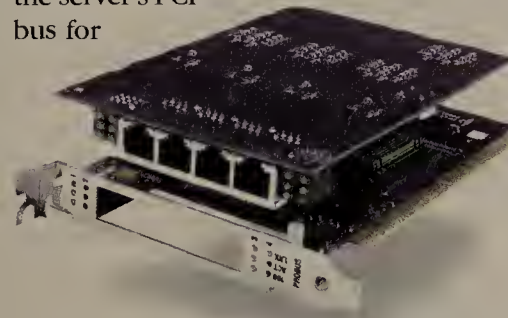
SALT LAKE CITY — As switch vendors rush to fill the growing demand for server load balancers, Phobos Corp. has found a way to set itself apart from the crowd.

Instead of delivering a full-blown stand-alone switch, the company is introducing a wire-speed switch that takes the form of a PCI-based server card.

Phobos CEO Rick White says that making a server card is less expensive than making a stand-alone device, and as a result, the company sells its load balancer for less than competing products. At roughly \$2,000, the Phobos In-Switch costs about one-third the price of Foundry Networks' ServerIron, one of the least expensive server load-balancing switches available, at \$6,000 for an eight-port 10/100M bit/sec model.

The real issue, however, is what users

gain — and lose — by running a switch inside a server. Although the In-Switch doesn't use the server's CPU, it relies on the server's PCI bus for



Phobos' wire-speed switch takes the form of a PCI-based server card.

power. So if the server crashes but power is still flowing to the bus, the switch will still run. If the server is turned off, the switch will stop.

Phobos is marketing the switch as a device that can extend a server's bandwidth. Typically, you would put one In-

Switch in a server and connect three other servers to it. The switch will balance Web traffic among all four servers.

However, because a server running Web services such as e-mail is likely to need regular maintenance, you might consider housing the In-Switch in a dedicated server. If you do that, then the cost of the switch plus the server might be higher than a dedicated switch.

The In-Switch has a dedicated processor, 32M bytes of memory, and performs Layer 4 to Layer 7 switching.

The first cards will support four 10/100M bit/sec ports. Up to eight cards, or 32 ports, can be plugged into a server. The limitation is the PCI bus, White says.

The initial version of the In-Switch will support Solaris, Linux and Windows NT. Phobos plans to add support down the road for AIX, HP-UX, Irix and NetWare.

The switch is scheduled to ship in July. Models that support Gigabit Ethernet are slated to ship in the fall.

Phobos: (801) 474-9200

SanCastle storms into storage network market

Multiprotocol switch links storage networks across Gigabit Ethernet LANs and WANs.

BY DENI CONNOR

Only the beginning

SAN JOSE — Start-up SanCastle Technologies has introduced its first product, a switch that speeds communication between Fibre Channel-based storage-area networks (SAN) by connecting them via Gigabit Ethernet LANs or WANs.



The SanStorm 3000 switch connects storage-area networks via Gigabit Ethernet.

Companies can already zip data across a SAN via Fibre Channel switches operating at up to 28G bit/sec. But companies have hit bottlenecks trying to exchange data between SANs across Gigabit Ethernet or other LAN and WAN pipes.

The SanStorm 3000 switch sits between Fibre Channel devices, such as storage subsystems, and Gigabit Ethernet switches or routers.

The nonblocking switch features a mix of eight Fibre Channel and Gigabit Ethernet ports, and boasts a 16G bit/sec backplane.

SanCastle is also readying a 64-port enterprise switch that will employ a 128G bit/sec backplane.

Customers will be able to configure and manage both switches with SanCastle's SanMan management software.

Net managers should expect to see more multiprotocol switches emerge as Fibre Channel SANs catch on, says Dave Hill, an analyst with Aberdeen Group in Boston.

Proposals have been submitted to ANSI suggesting the use of SONET or ATM technologies to extend Fibre Channel networks over WANs.

Separately, the Gigabit Ethernet Alliance is exploring ways to make Gigabit Ethernet and Fibre Channel work well together.

SanCastle is talking with companies such as Gadzoox Networks, Brocade Communications and Vixel about incorporating SanStorm technology into their Fibre Channel switches.

There's also the possibility of building SanStorm technology right into other companies' Fibre Channel gear.

SanCastle was founded by a group of entrepreneurs with experience in the storage and switch markets.

Chairman Jacob Herbst, Chief Technology Officer Moishe Zeiger and President Mitch Levy have been with companies such as Bytex, Fibronics and NEC.

The SanStorm 3000 will be available in September and will be priced at less than \$1,500 per port.

The SanStorm 5000 will follow in January.

SanCastle: (408) 435-8100

Anota makes Web-to-host links a snap

BY MARC SONGINI

NORCROSS, GA. — Users looking for inexpensive, easy-to-install PC-to-host emulation software may want to consider start-up Anota Ltd.'s Java Terminal software.

Java Terminal 2.0 can quickly establish a session between any browser-equipped PC and an IBM mainframe, AS/400 server or Digital Vax host. Browsers, Web servers and other Internet access products are attractive to users because browser software is easier to install, configure and maintain than traditional SNA or other host-emulation software.

Java Terminal 2.0 also includes support for secure sockets layer protection. In addition, the software adds support for a management reporting tool that records session activity.

PC users establish sessions by downloading a Java Terminal applet embedded on an HTML page residing on a Web server. The applet then initiates a ses-

sion with the host. Once the session is running, the host and client communicate directly via a TCP/IP telnet link. For example, the software supports tn3270 and tn5250 transmissions for sessions with the SNA applications on mainframes and AS/400s, respectively, or VT-320 datastreams for communications with Digital hosts. Users can print screen data from their

PCs or workstations.

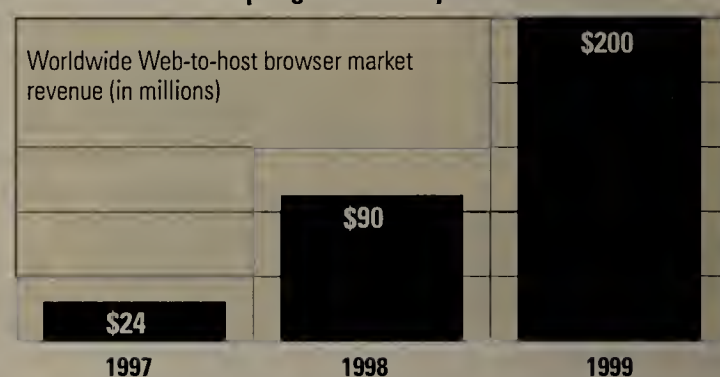
Anota claims Java Terminal can be installed on a Web server in 15 minutes by in-house staff. To ensure security, IT personnel can create profiles on the Web server to control user or workgroup access to tn3270, tn5250 and VT-320 emulation sessions.

Java Terminal 2.0 costs \$100 per client and is available now.

Anota (770) 447-9774

A better way to access data

Analysts are predicting that the Web-to-host browser market will continue its rapid growth this year.



SOURCE: IDC, FRAMINGHAM, MASS.

Office 2000, continued from page 17

Internet Information Server (IIS) when running the extensions because most of the CPU load is concentrated there, he says. Administrators can use clustering and load balancing, or subsystem-specific tuning, according to the report, titled "OSE Scalability and Deployment Planning."

Enterprise users also should avoid Service Pack 3 for NT and run Service Pack 4, according to the report. Service Pack 3 has incompatibilities with OSE that may cause IIS to temporarily shut down.

And then there is the issue of Web browser access to online Office 2000 documents.

According to the CSA report, browsers that do not support Microsoft's Component Object Model (COM) will exact a heavy toll on back-end servers and won't be able to directly annotate OSE-hosted documents.

"Microsoft is trying to downplay the tax that Web browsers which don't support COM can put on the back end," Kennedy says. "But those browsers can be a real nightmare."

Kennedy says in certain sit-

uations those browsers can saturate IIS and shut it down temporarily.

The reason is that non-COM browsers require server-side processing of collaboration content. In Internet Explorer 4.0 and Internet Explorer 5.0, which support COM, processing takes place on the client.

But Internet Explorer 5.0 has its own set of problems with server extensions, specifically when used on Terminal Server, a multiuser version of Windows NT. The COM object in the browser does not like multiple instances of itself running on the same server, a common occurrence on Terminal Server deployments. The results can be error messages that force users to refresh pages or restart the browser, according to the CSA report. Internet Explorer 4.0 does not have the problem.

Despite the Terminal Server problem with Internet Explorer 5.0, that version of the browser actually is best suited for collaborating on Office 2000 documents. This is because Version 5.0 has an embedded Discussion tool bar that supports the OSE-collaboration features.

"We used Internet Explorer 5.0 and the server extensions in

our pilot without any trouble or issues on the back end," says Steve Kelliher, project manager for software vendor J.D. Edwards. The company plans to roll out the applications to 6,000 desktops and won't use a server-centric deployment.

While the study found that the server extensions in general were scalable and robust, it did conclude that administrators "need to clearly define their functional requirements upfront so that they can anticipate client loading levels and tailor an appropriate server hardware solution."

The complete OSE report is available online at www.csaresearch.com. ■

PROFILE: SANCASCADE

Based:	San Jose
Founded:	May 1998
Primary business:	Fibre Channel storage-area network switches
Founders' background:	Network infrastructure and storage vendors
Funding:	\$5 million from CIBC Oppenheimer/Genesis Partners and unnamed investors
Web address:	www.sancastle.com



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New \$40 million venture fund targets convergence start-ups

BY TIM GREENE

WELLESLEY, MASS. — For Battery Ventures, Convergence is more than

just a network industry buzzword — it's the name of a new \$40 million venture capital fund earmarked for start-ups that want to put corporate voice,

data and video traffic onto the same network.

The Convergence Fund has drawn big-name corporate investors to share

not only their cash, but their demands for the products needed to make convergence real.

Service providers Ameritech, Bell Atlantic and Williams Communications are contributors, as are Nortel Networks, Novell and Corning. Among those on the fund's board is top MediaOne shareholder Amos Hostetter, who will help lead AT&T's initiative to put voice, video and Internet access services on its cable TV networks.

The fund is expected to back makers of products such as ATM-based long-distance switches, billing software and hardware for putting more traffic on fiber-optic nets.

Todd Dages, a partner at Battery, says the company wants to fund firms that can integrate packet and circuit technologies.



Battery's Todd Dages wants firms that can integrate packet and circuit nets.

The first two firms that have been funded are in the on-line commerce market.

One, petstore.com, will sell pet products on the 'Net. Dages admits this will not be the typical Convergence Fund investment.

The other, which Dages would not name, is developing software for setting up online brokerages that would trade in any number of commodities.

Once start-ups financed by the fund have products, Dages expects the established companies contributing to the fund to become test sites, as well as buyers, for the new offerings.

The companies backing the fund represent about \$10 billion per year in purchasing power, he says.

Coupling up

Finding potential customers can be a lot harder for start-ups than coming up with money and ideas, Dages adds.

Battery will manage the flow of information between the start-ups and the investors so the new companies don't risk losing the intellectual property that makes them valuable, Dages says.

But when the start-ups need help from the outside, fund members can come to their aid.

"There comes a time in any company's life when it needs to hook up with partners. We think we have a good way for them to find partners," Dages says. ▀

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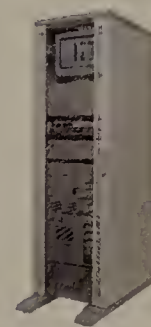
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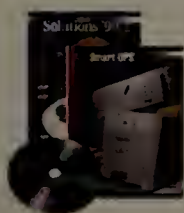
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Wired Windows . Dave Kearns

LAN MANAGER REINCARNATED

*"We learn from history
that we learn nothing from
history."*

— George Bernard Shaw

Microsoft and Intel recently jointly announced the next "big thing" for small business networking — the Windows NT Server Appliance. This follows on the

heels of Novell's announcement of an Internet caching appliance.

These new offerings seem to presage a new era for networking, perhaps to

be dubbed the "Frigidairization" of networking. (Aside: Frigidaire was the first big name in automatic refrigerators. Automatic because, instead of putting the ice in yourself, a sealed refrigerant kept the box cold.)

The Windows NT Server Appliance — Intel-based, of course — will run the new embedded version of Windows NT 4, which is just now entering beta tests. The operating system will be made available to hardware makers under OEM arrangements. These hardware companies can customize various services and drivers or add new ones written by themselves or third parties.

If you've been in the industry for more than a few years, you'll remember that this is exactly the scheme under which the LAN Manager network operating system was sold and marketed. You didn't buy LANMan from Microsoft. Rather, you bought it from an OEM company that took the Microsoft operating system kernel and services, added and subtracted drivers, utilities and applications, and then sold the package under the LAN Manager name, or under the OEM company's own brand.

If you remember that much, you should also remember that this scheme was not very successful, costing OEMs many, many dollars for marketing, service and support while bringing remarkably incompatible products to your network. The experience was so bad that most of the LANMan OEM companies ended up bailing out of the network operating system business.

Showing a decided ability to shoot themselves in both feet simultaneously, Intel and Microsoft will release the Windows NT 4-based appliance at about the same time that Windows 2000 makes its debut.

Confused? You ain't seen nothing yet.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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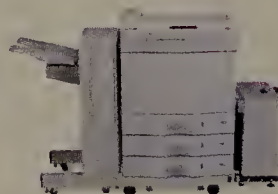
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Tip of The Week



If you've e-mailed me recently and I haven't gotten back to you, my apologies. I've been using Microsoft Outlook Express as my e-mail client since it was first released with Internet Explorer 4. But the new version with Explorer 5 randomly removes messages and folders whenever Windows crashes (how often does that happen?). I still like Outlook Express, but I'll stick with Version 4.



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Briefs

Cisco says AT&T will use Cisco SNA products as part of a service to migrate SNA users to IP nets. AT&T's Global Network Services unit will use CiscoBlue Maps and SNA View management software, and queuing software for customers of AT&T's Managed Data Network Services. The software will give AT&T visibility of customer SNA devices, and correlation and mapping of frame relay and router resources used in support of SNA applications. This will let AT&T prioritize frame relay PVCs for delay-sensitive SNA traffic across its Global Network Services backbone, Cisco says. The enhanced AT&T Managed Data Network Service with SNA/IP management will ship in June. AT&T Solutions: (973) 360-8000

Thirty-three U.S. senators have signed a letter supporting Federal Communications Commission Chairman William Kennard's call to increase funding for the E-rate schools program to \$2.25 billion per year. The move raises a barrier to a bill introduced by Sen. Conrad Burns (R-Mont.) and Rep. Billy Tauzin (R-La.) to limit E-rate's scope and eliminate user surcharges to pay for it, funding E-rate instead from excise taxes and the federal budget surplus.

PSINet is making its dial-up Internet access service more secure. The ISP has added SecureRemote service to InterRamp, its existing dial-up package. SecureRemote lets users set security policies such as authorized user lists. PSINet has also deployed Compatible Systems Intraport virtual modem pool access devices at the firm's dial-up points of presence to support the IETF's IP Security features. The service should be available in June for about \$20 per month per user. PSINet: (703) 904-4100

Carriers bolster ATM service packages

BY DAVID ROHDE

LAS VEGAS — Reflecting the growing popularity of ATM as a user service, two carriers have extended their ATM offers — one to the local area, the other around the globe.

At the recent NetWorld+Interop 99 show, MCI WorldCom announced Metro

with common features across local, domestic and international boundaries.

MCI WorldCom's Metro ATM will be offered in three service classes — constant bit rate, variable bit rate non-real-time and available bit rate. Metro ATM initially is available in two port speeds — T-1 and T-3 — with OC-3 connectivity, at 155M bit/sec becoming available shortly.

cant cost savings vs. its regular long-distance ATM service.

Users have tended to purchase local carriers' ATM services for multiple sites in metropolitan areas to save money. But those customers have had to run two ATM nets or deal with a network-to-network interconnection (NNI) between their local and long-distance ATM nets. Now the local ports for Metro ATM will be on the same switches that MCI WorldCom plans to use long-term for long-distance service. That means all ATM traffic will enjoy the same features on a single net.

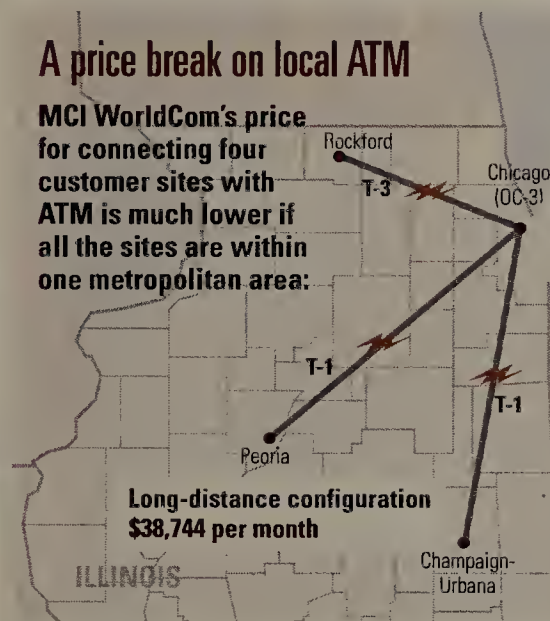
But users will have to choose carefully if they want that benefit. The switches for the local/long-distance ATM net will be devices from WorldCom — Cisco BPX ATM switches — not the Newbridge Networks equipment used in the legacy MCI net. That net is still supported, but the WorldCom network will be favored in the future.

Equant hopes to beat MCI WorldCom and other carriers to the global ATM punch with its new global ATM service. Equant's offer begins with two service classes — constant bit rate and variable bit rate non-real-time, supporting speeds up to OC-3. The service operates over a unified net of Nortel Networks ATM switches without NNIs among countries.

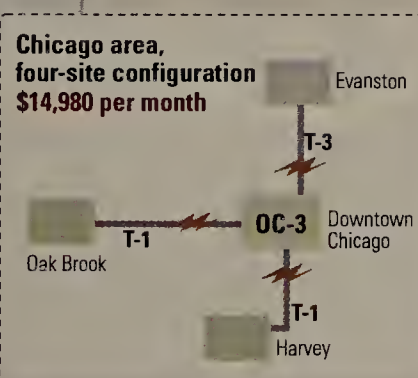
Under the service, a 2M bit/sec connection from the U.S. to Japan will cost \$54,000 per month using variable bit rate; a 10M connection on the same route will cost \$130,000. A 10M France-to-Germany connection will cost \$45,000 a month. ▀

A price break on local ATM

MCI WorldCom's price for connecting four customer sites with ATM is much lower if all the sites are within one metropolitan area:



Chicago area, four-site configuration \$14,980 per month



Note: Examples assume one of the PVCs uses constant bit rate ATM at a peak cell rate of 10M bit/sec and the other two use variable bit rate PVCs with a sustained cell rate of 768K bit/sec. Access-line charges are additional.

ATM, a service that provides multiple ATM connections within a metropolitan area at less than half the cost of MCI WorldCom's long-distance ATM service. Also at N+I, Equant Network Services, a specialized international voice and data carrier, launched its first global ATM service. The idea is to offer users an ATM net

The price for any port on an MCI WorldCom switch that handles only permanent virtual circuits (PVC) to user sites in the same local area will be lower than the regular MCI WorldCom price for long-distance ATM. The firm has never released its ATM port and PVC prices, but it did offer a pricing scenario showing signifi-

C&W 'Net service open for business

BY DENISE PAPPALARDO

Cable & Wireless USA is offering an all-in-one service that makes it easier for small to mid-size companies to get on the 'Net.

The WebReady service offers dedicated 'Net access with hardware and software from IBM, Microsoft and Cisco so users can move business to the Web quickly and inexpensively. The service includes:

- Dedicated Internet access from 128K bit/sec to T-1 1.544M bit/sec
- IBM Netfinity 3000, 5000 or 5500 servers
- Lotus R5 Mail Server software
- IBM WebSphere Studio and Application Server

- Microsoft Windows NT software
- Cisco 2610 or 2613 router with IOS firewall software

Cable & Wireless will deploy the Netfinity servers, and WebSphere Web site authoring tools and application server, e-mail server and router at WebReady customer sites. Cable & Wireless will be the customer's single point of contact for the service.

Cable & Wireless will provide 24-7 monitoring of WebReady customer connections, servers and routers, says Art Medici, senior vice president of marketing at Cable & Wireless USA. A separate dial-up connection will be configured on each WebReady Web server so that if a customer's Internet access link goes down,

Cable & Wireless can still reach the Web server to run diagnostics, he says.

WebReady is available now for up to \$2,000 per month for a dedicated T-1, IBM Netfinity 5500 server and Cisco 2613 router.

Cable & Wireless: (703) 790-5300

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Wan Monitor . Daniel Briere and Christine Heckart

ASPs BUILD MOMENTUM

Like the ISP movement of the early 1990s, the applications service provider (ASP) movement could be huge. Network-hosted applications

could completely change the way we buy, sell, live and interact with businesses and people. The question is: How will it impact you and when?

Last week's announcements at NetWorld+Interop 99 underscored the momentum behind this movement.

For example, Sprint announced plans to deliver basic as well as sophisticated applications over its Integrated On-Demand Network. US WEST announced it would distribute USinter-

networking's ASP services throughout its 14-state territory; and 25 vendors and service providers — including AT&T, Cisco, Sun and MCI WorldCom's UUNET — established the ASP Industry Consortium. The ASP Industry Consortium will develop common ASP definitions, sponsor research and educate users and vendors.

In addition, the learningstation.com demonstrated a high-performance application service focused on the educational market. The service, which offers basic applications such as Microsoft Word and Excel, will be offered at low prices, too — starting at \$169 per desktop for a year. Compare that with the cost of putting Microsoft software on every employee's desktop!

Then US WEST announced plans to ship Alcatel screenphones to Internet customers. In talking with US WEST's marketing crew, this is just the beginning of what they think will be a huge market for Internet appliances.

The ASP market is not just a high-bandwidth ploy (although with US WEST's new \$29.99 price for digital subscriber line, it's hard to imagine why it won't be just high bandwidth soon). It is also for narrowband and dial-up modem services.

Soon you'll be keeping grocery lists on the Internet through screenphones, so you can input them at home but download them at work before you go to the grocery store.

Qwest continues to be two steps ahead in this arena. The company is one of the few players today that can pitch full end-to-end control over applications because of its local access deals with Covad and Rhythms NetConnections.

That means the company can offer full quality of service and service-level agreements. That's significant because reliability and availability will be key differentiators in the ASP arena.

Everyone needs to remember that this is a young market. Let's not kill it by setting unrealistic expectations. We do not recommend that you go with suppliers who do not meet reliability, availability and security thresholds. But let's be reasonable, particularly as we talk about remote offices, telecommuters and small and mid-size businesses — the true mainstream for applications.

Judge for yourself but weigh the evidence in light of the number of users, applications, relative costs and opportunity to free MIS up from some tactical firefighting to focus on solving strategic business problems.

Briere is president and Heckart is vice president of TeleChoice consultancy in Boston. They can be reached at dbriere@telechoice.com and heckart@telechoice.com.

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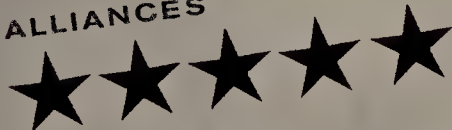
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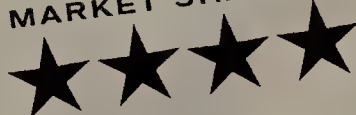
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—Yankee Group/Upside Magazine, FEBRUARY 1999

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Dynamic Tape Drive and Library Re-Configuration	✓		
High-Speed Image Backup	✓		
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Briefs

Segue Software has shipped SilkPerformer 3.0, the latest version of its application and Web server tool for stress-testing electronic commerce applications. The \$20,000 Windows NT-based tool, which simulates the buying behavior of large volumes of online shoppers, now lets Web merchants test the results with all buyers originating from content portals, such as Yahoo or Netscape.

Segue: (781) 402-1000

The U.S. Department of Commerce's National Technical Information Service last week unveiled a search service for government documents at www.usgovsearch.com. The feds, however, have put the plan on hold as they determine whether the system goes against a government policy on unrestricted access to government information. The service was built with the help of Cambridge, Mass.-based company Northern Light Technology.

A \$30 monthly access charge would have users search 20,000 civilian and military Web sites containing about four million pages of content.

Cisco recently invested \$39 million in Portal Software, a developer of customer management and billing software for Internet and emerging communications services. In addition to the investment, Cisco says its engineering and marketing teams will work with Portal to develop products that integrate Cisco Service Management technology with Portal's customer management and billing software, Infranet. Infranet helps Internet and next-generation communications services rapidly develop, price and provision new services, and manage customer usage and billing.

IN-SITE: *Lessons from Leading Users*

Teaching the Web to speak to everyone

BY ELLEN MESSMER

When leaders of the city of Bakersfield, Calif., started using the Web to inform its citizens about local events, job listings and municipal services, they naturally provided all the content in English.

But it soon dawned on city planners that Bakersfield's growing Spanish-speaking population might be missing out. So two years ago, planners started looking for a way to deliver the city's ever-changing stream of news in Spanish, as well. A few months ago, Bakersfield started using Web-based automated machine translation that turns English into Spanish on the fly.

Lost in the translation?

"The translation isn't always exactly correct, but it's not expensive," says Bob Trammell, Bakersfield's MIS director. Cost matters because the city has operated its Web information service "on a shoestring budget from the very beginning," he says.

Document translation by language professionals is an expensive proposition. Machine translation is far less

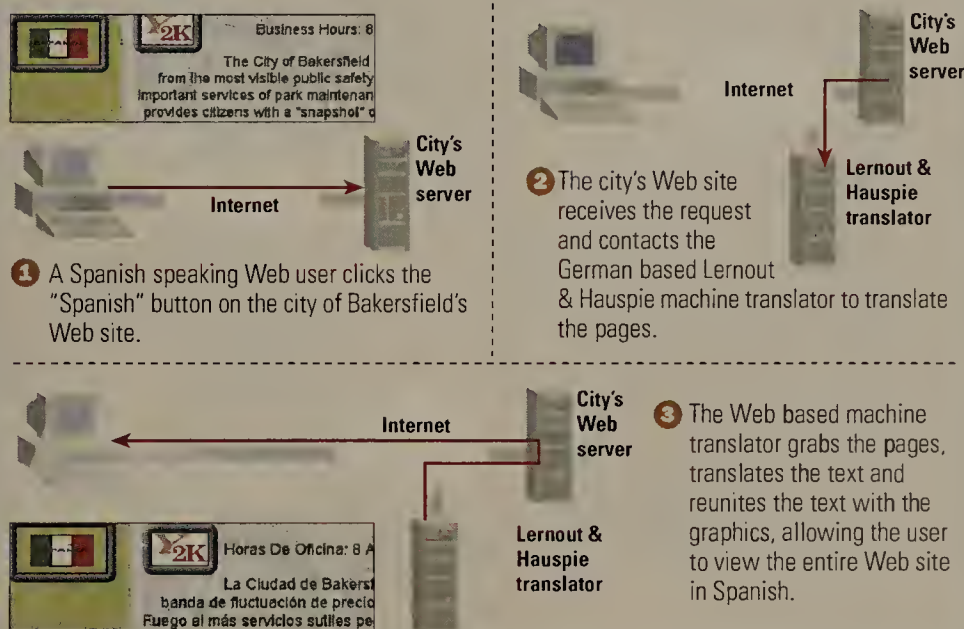
expensive, if lacking linguistic polish.

"We had a Web page describing how to get a building permit, which

See **In-Site**, page 30

Web-based language translation

The city of Bakersfield is using automated machine translation on its Web site, www.ci.bakersfield.ca.us.



Terminal Server pulled into mgmt. suite

BY JOHN FONTANA

Those struggling to manage users on Microsoft's Windows Terminal Server will get a bit of a hand this week from Mission Critical Software.

The Houston company is adding support for Terminal Server and Citrix's MetaFrame to Version 5.0 to its Directory Administrator tool. The new software, which is part of the company's OnePoint system management suite, lets network administrators manage all 19 Terminal Server user properties from a single console. The console also includes administrative controls for NT and Exchange users.

Server-centric computing is beginning to play a more important role in the enterprise as corporations look for different ways to deploy software and control costs. According to International Data Corp., 50,000 to 60,000 Terminal Servers

are already deployed worldwide.

To highlight the growing demand, Microsoft is building these multiuser server capabilities into Windows 2000. The follow-on is the need to manage users.

"Directory Administrator is a service that will make life for administrators easier by making it more automated," says Richard Ptak, an analyst with the Hurwitz Group in Boston. "This is the type of device that can free administrators from a single desktop and allow for remote administration."

With Version 5.0, administrators can also delegate authority for user management on an administrator-by-administrator basis. Directory Administrator 5.0 is the first third-party tool that separates Terminal Server management into a stand-alone function. The tool also allows for setting policies on who can perform what tasks and for auditing changes to user configurations.

"NT-based administration can't provide granular controls on administrations and delegation," says Kent Erickson, director of product management for Mission Critical.

Directory Administrator 5.0 runs on NT and the forthcoming Windows 2000. Support for Terminal Server management is a free upgrade for existing OnePoint customers. The OnePoint suite is priced at \$27 per managed user account.

Mission Critical: (713) 548-1700

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- Overviews of Terminal Server management options from Microsoft and Lakeside.
- Microsoft white papers on Terminal Server deployment.

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DB2 meets the Web

BY JOHN COX

ORLANDO — IBM's newest DB2 release ties large databases more closely to Java, Linux, Extensible Markup Language (XML) and other Internet-oriented technologies.

DB2 Version 6.1 offers improvements in transaction performance, expanded support for Java and connections to enterprise directories via Lightweight Directory Access Pro-

frame data and transaction systems with Web-based application servers and browser access.

For Version 6.1, IBM created the new Java Stored Procedure Builder, a graphical tool for creating application logic in Java and storing it in the database. The tool works closely with IBM's VisualAge for Java tool set or Microsoft's Visual Studio.

By adding the LDAP interface in Version 6.1, IBM lets DB2

these suites by between 20% and 100%, says Janet Perna, general manager of IBM's data management business. She says these results, based on lab tests, will be published soon.

Version 6.1 applications will make more use of XML, a standard format for capturing and representing data in Web documents. Using release 6.1, developers can store XML documents in DB2 and work with e-commerce applications that use XML as the format for exchanging data.

IBM has launched a beta test of a new DB2 program, called

ChiliSoft bridges Microsoft Linux gap

Active Server Pages can now run on Linux, offer an option to CGI.

BY ROBIN SCHREIER
HOHMAN

BELLEVUE, WASH. — Start-up ChiliSoft plans to make it easier for developers to run Microsoft Active Server Pages (ASP) on Linux systems.

ASPs let you integrate dynamic content, such as databases and forms, into Web pages or Microsoft ActiveX components. While ASP was intended to run on Windows NT and Microsoft's Internet Information Server (IIS), ChiliSoft ASP allows those pages to run under other operating systems.

ChiliSoft already sells software that lets ASP pages run under Sun Solaris, IBM AIX and Windows NT, with support for Web servers from Apache, Lotus, Netscape and O'Reilly.

ChiliSoft ASP for Linux will now bring ASP capabilities to the popular open source operating system. Without ASP, developers have to write Common Gateway Interface scripts or use products such as Allaire's Cold Fusion to create interactive pages.

Developers can write ASP pages on any platform and use ChiliSoft ASP Linux software to run those pages on Linux.

ASP applications, or .asp

files, contain HTML and scripting code to create the interactive portions, and are usually written as Visual Basic scripts. ASP pages are generally easier to write than .cgi scripts, and are becoming quite popular on the Internet.

ASP's increasing popularity is partly due to ease of use.

"Technology choices can constrain your choice of staffing," says Charles Crystle, CEO of ChiliSoft. "If you have Java or C++ developers, you want them building the business logic, and you want the Visual Basic developers building the pages."

While Microsoft makes ASP available for free download, other vendors sell products to make it easier to develop ASPs. Essential Software's Drumbeat 2000 provides a drag-and-drop interface to create Web front ends to existing applications, another function of ASPs.

ChiliSoft also makes ChiliReports, which converts database reports to Excel spreadsheets for Web viewing, and ChiliBeans, which converts a Java component to a Component Object Model object.

ChiliSoft ASP for Linux will ship in the fourth quarter, and will sell for around \$1,000.

ChiliSoft: (425) 957-1122

What's new in IBM DB2?

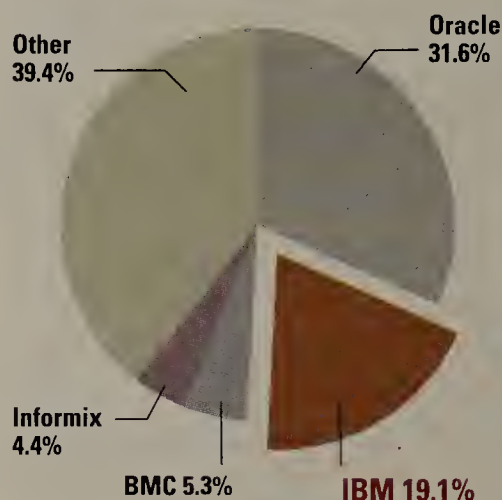
IBM hopes its new, feature-loaded version of DB2 will keep the company near the top of the database management system (DBMS) market.

New features in DB2 Version 6.1 include:

- Linux compatibility
- Java Stored Procedure Builder, for writing code in Java and storing it in the database
- Lightweight Directory Access Protocol, to access information in LDAP directories
- Index SmartGuide, a tool that database indices use for best application performance
- Increased support for XML applications
- Tweaking to boost transaction performance for enterprise resource planning applications (SAP, et al)

SOURCE: IBM, ARMONK, N.Y.; IDC, FRAMINGHAM, MASS.

1998 DBMS revenue market share
Total market: \$12.4 billion



tol (LDAP). And for the first time, the venerable database will run on the Linux operating system, which is gaining support as the basis for a wide range of Internet applications.

The release, unveiled last week at the International DB2 Users conference in Orlando, will ship at the end of July.

After a strong quarter of DB2 sales, IBM is working to associate DB2 with electronic commerce, which marries main-

store and retrieve configuration data from network-based LDAP directories instead of the more limited directory service of the computer's operating system.

IBM also will introduce new data-conversion tools to make it easier to shift applications from rival databases to DB2.

Working with Enterprise Resource Planning vendors, such as SAP AG and PeopleSoft, IBM was able to boost the transaction performance of DB2 with

an extender, to speed searching for XML content stored in the database, Perna says.

IBM has discontinued per-user pricing for DB2, shifting in Version 6.1 to per-processor licensing for the Enterprise and Extended Enterprise DB2 editions. This will let customers affordably deploy large e-commerce applications. Prices start at \$12,599. The single-user Personal Edition is available for free via IBM's Web site. ■

In-Site,
continued from page 29

said, 'Go up to the counter and ask for the form,' " Trammell points out. "The machine translation turned 'counter' into 'person who counts things.' So we changed the word to 'desk.' "

With a few such changes to English content, Bakersfield has made automated machine translation an effective means of reaching its Spanish-speaking populace on the Web.

To perform automated translation, Bakersfield uses a software package called iTranslator Publish on its Web server.

Developed by Belgium-based language services firm Lernout & Hauspie, iTranslator lets you put HTML tags on the pages you want translated. When the Web visitor clicks on the Spanish icon at www.ci.bakersfield.ca.us, a translation process of international proportions begins.

"Each tag has an HTTP statement that goes to our Web server in Munich," explains Randy Morris, senior product manager of machine translation at Lernout & Hauspie. "Common Gateway Interface commands associated with the URL show this page needs to

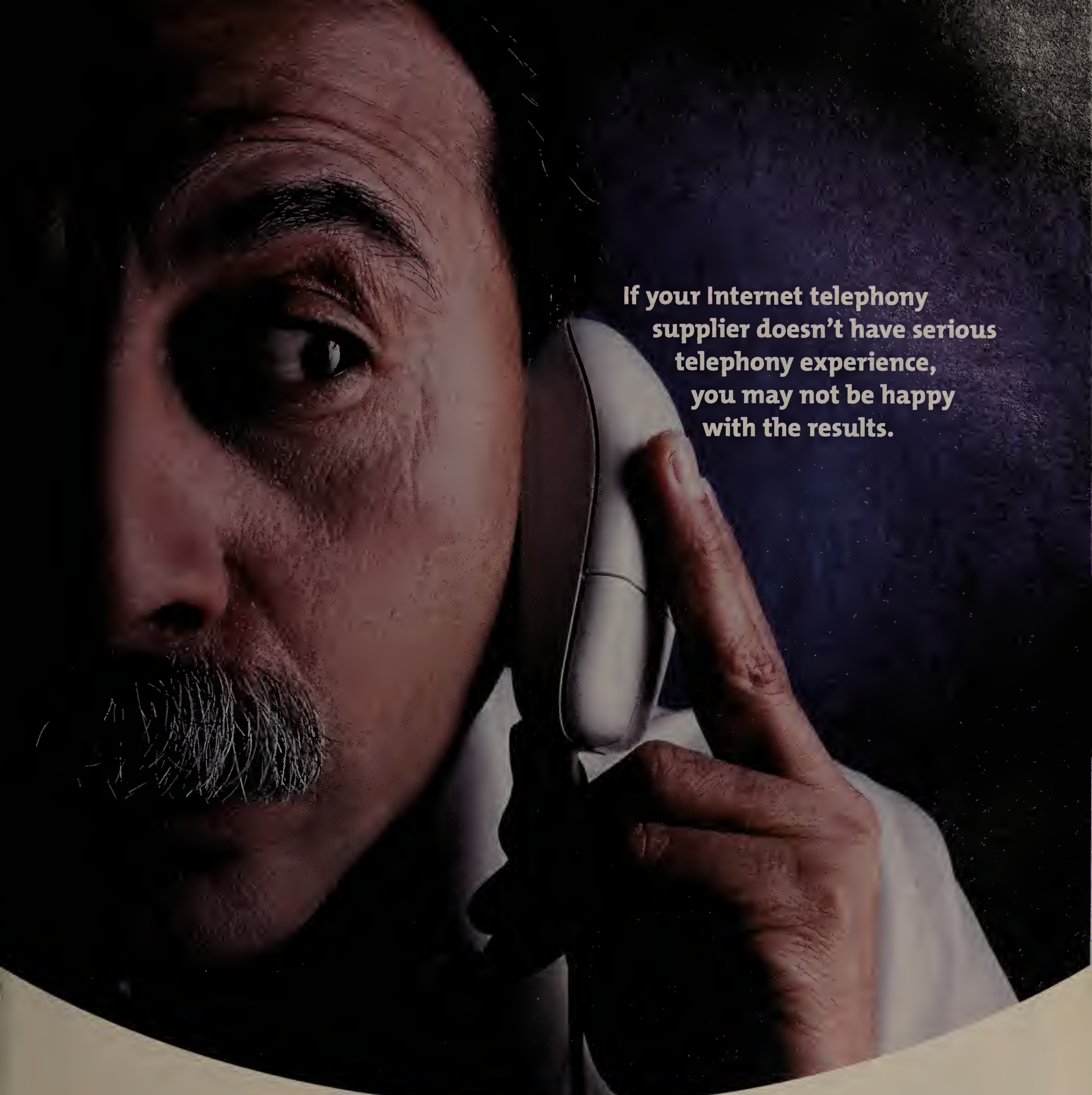
be translated. Our Web server in Munich then grabs the request and goes back to the server in Bakersfield."

Once the translation server retrieves the page, it translates the text into Spanish, reunites the text and graphics, and presents it all to the Spanish-speaking Web user.

According to Trammell, this long-distance translation process only adds 2 or 3 seconds to the usual Web presentation time. "The Spanish feature is very popular, especially for finding out about park activities, like swimming lessons or yo-yo championships," he says. ■



ChiliSoft CEO Charles Crystle has a range of tools that work with Microsoft technologies.



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'Net Insider . Scott Bradner

FADING GLITZ IN LAS VEGAS

There were some significant changes at the NetWorld+ Interop 99 show in Las Vegas this year, and I'm not even talking about the

changes to the show, which have already been discussed in *Network World* (May 10, page 1). Technologies in vogue have taken another spin, with

virtual private networks (VPN), IP telephony and quality of service (QoS) winding up on top and ATM, among others, fading from view.

A full tour of the show floor made it clear the sign painters knew how to spell VPN. But it was also clear that the vendors do not all spell

VPN the same way. There was a significant dichotomy between those vendors talking about firewall-to-firewall VPNs and those that said a VPN is the encrypted tunnel between a telecommuter or road warrior and the home office.

Sometimes it took a bit of discussion before I could determine which belief set a particular vendor espoused. In retrospect, I expect my confusion was generally due to a knowledge deficit on the part of the individuals occupying the booths and wearing the company T-shirts. Once upon a time, one would find the technically clueful product designers or implementers in the booths at Interop. But those days are long gone — one is far more likely to find roulette wheels or acappella groups singing the praises of products they only recently learned to pronounce.

In any case, there seem to be a lot of vendors that think they are going to make some money on VPNs. About 80 companies were listed under the VPN category in the show guide.

IP telephony did not do quite as well, with roughly 60 companies listed under Internet telephony and about 50 under computer telephony integration. Just over 50 companies fell into the QoS category.

To put these numbers into perspective, approximately 100 companies were listed under Internet access and 114 under bridges/routers/gateways. But if one measured by hype level on the show floor, the traditional Internet hardware and access vendors didn't stand a chance. The discrepancy between the attention that the newly-hyped technologies got and what the traditional Internet iron was afforded was bigger than I can remember since ATM's heyday.

Speaking of ATM, this technology was the invisible visitor in Las Vegas this year. I could hardly find any vendors touting their ATM prowess even though nearly 40 companies mentioned ATM in their descriptions in the show guide, which did not even have an ATM product category. I do not see all this as an indication that ATM is fading into the Nevada sunset. (Which was quite nice, even though it was hard to see because of the slightly overdone casino lighting.)

ATM seems to have moved to being drab infrastructure, and that just might be a good thing for fans of the technology.

Disclaimer: Harvard is often an invisible visitor in power circles, but the above is my own opinion of the sunset.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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There's no quick fix for Y2K on PCs

BY JOHN COX

With just more than six months to go before Jan. 1, 2000, perhaps the most important thing network administrators can do is forget about killing the Year 2000 bug on networked desktops in one fell swoop.

Instead, net administrators should consider setting up a framework of procedures, tools and systems to track the bug's appearances and make those problems easy to fix on corporate PCs and laptops. The bug exists because older software typically was not written to handle the date shifting from 1999 to 2000.

By now, it's clear that seeking a once-and-for-all solution to the desktop Y2K problem is a time-wasting illusion. On the surface, the problem seems simple to fix. But on PCs, there is a complex set of interactions among the operating system and other system software, such as the BIOS, as well as the panoply of desktop applications.

And not all the information on these desktop pieces is complete. In fact, many software vendors continue to find new Y2K-related problems that have to be fixed by issuing a steady stream of software updates or patches. These discoveries render many bits of software once labeled "Y2K-compatible" as only "compatible, but with conditions."

"We've definitely seen an increase in the number of products [whose Y2K-compliance information is] being changed," says Kevin Weaver, executive vice president of Infoliant, a Pittsburgh firm that maintains a database of 30,000 software and hardware products and their degree of Y2K compatibility. "Up until early 1999, it was just a few dozen products changing each month. Then it skyrocketed: Now there are 500 to 600 products per month being changed."

One step forward, two steps back

Earlier this month, Microsoft announced a new Y2K Web site and a Y2K education program for customers. This happened at almost the same time Microsoft was alerting Infoliant that some new Y2K problems had surfaced in Windows 95, which had been classified as Y2K-compliant. For instance, if users installed Dial-Up Networking 1.3 or Winsock2 before installing the Windows 95 Year 2000 update, the update software would not make the date change properly.

The complexity of keeping up with Y2K changes on the desktop can be seen by reviewing just a few of the products tracked by Infoliant's Y2K database (www.infoliant.com). For instance, in order for Microsoft Exchange Server Enterprise Version 5.5 to be Y2K-compliant, customers must install Exchange 5.5 Service Pack 2. But if some of the Exchange Server components are not installed, then Service Pack 1 is compliant. The bottom line is that customer sites may have several different versions of the same software, all of which may require different fixes.

Infoliant's experts say most of the major changes

DESKTOP Y2K
*Tools and procedures
give you a grip on a
slippery goal.*

Fixing Y2K on the desktop

Addressing desktop Y2K problems is a bit like trying to hit a moving target. Here are some guidelines to help the process:

- Accept that it's unlikely you'll fix everything and keep it fixed.
- Check out tools for discovering, identifying and listing desktop software.
- Look for services that centralize software vendor information and fixes.
- Set up tools and procedures for automatically distributing software repairs and patches.
- If you're a smaller company strapped for resources, check with your larger trading partners for help. It's in their best interest that you're Y2K compliant, too.



in Y2K status have been made in the most popular PC applications. Yet the rate of Y2K status changes has sharply increased over the past few months as vendors uncover new, if relatively small or limited, problems.

Many of these new changes concern minor problems, or those that will occur only in certain circumstances or with a certain combination of software products in specific versions. Chris Spain, president and chief technology officer of Y2K vendor Shaman Corp., says one Shaman customer discovered his company had 62,000 program titles, including auxiliary .exe files and subversions. Microsoft Office, alone, Spain notes, has nearly 20 auxiliary .exe files that have to be considered in a Y2K analysis.

Keeping up with this constant flow of change is only one MIS challenge. Even more burdensome is applying each change to every PC in the company. For many, this still means sending out technicians, equipped with stacks of diskettes, comfortable shoes and strong leg muscles, to visit each desk in person and load the new software.

AutoNation of Fort Lauderdale, Fla., owns more than 400 car dealerships and several National and Alamo rental car agencies. Last year, the company

bought 2,000 Dell NetPCs with NT Workstation 4.0 to create a standard PC hardware and software package for its corporate headquarters, says Keith Holcomb, AutoNation's vice president of IT. The purchase also let AutoNation create a PC that seemed to be, at the time, Y2K-compliant.

"But when you have 150 different software packages, and the vendors are doing ongoing testing, they keep sending you an update that says, 'This release has two more Y2K patches,' " Holcomb says. "You never get 100% compliance."

Dell's sales staff suggested the use of On Technology's ON Command CCM, which is software for desktop management and configuration. A piece of client code is loaded onto each PC, communicating with the ON Command server.

As AutoNation's Y2K technicians get new patches or updates from software vendors, they can test them quickly in a special lab, then program the ON Command server to deliver and install the updates on the hard drives of each PC that requires an update. A process that once took days, even weeks, is now done in two or three hours. "We can deploy these fixes across the network to hundreds of machines at a time, without having to visit each one in person," Holcomb says.

Intelligent help

Shaman uses intelligent agents, which are loaded onto desktop PCs, to scoop up details about each piece of software, including the various .exe files and all subversions of each software title. The details are sent back to a server, called Enterprise Shaman, and compared to an online database of current data supplied by more than 250 software vendors. Enterprise Shaman can identify, among other things, which PC programs are Y2K-compatible and which are not. Shaman accepts software updates and patches from vendors, which are then downloaded to the Shaman server. Network administrators can use the server's Web interface to classify each problem and apply the fixes to relevant PCs. Finally, the agents, called Scouts, update the desktop configuration database to reflect the changes to the PC software.

These kinds of tools can give network managers a framework for understanding what software needs to be changed on the desktop and what doesn't. This type of software also can help a network staff manage the logistics of actually making those changes.

"It's not a static situation," Spain says. "You need to have an ongoing desktop discovery system that can continue to identify the exact fingerprint for each specific software version."

Using tools like these to create a management framework, users will be able to minimize the inevitable delays in responding to subsequent Y2K problems, especially in early 2000.

"If you're not ready, the combination of these delays could really be burdensome to your company," Holcomb warns. ▀



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Ask Dr. Intranet

By Steve
Blass

I frequently help remote intranet users work through software problems using Symantec's pcAnywhere32 over the

Web, but there are two problems. First, remote users must have a copy of pcAnywhere32. Second, users are forced to e-mail me their dynamically assigned IP addresses once they make their dial-up Web connections because they usually don't have a second phone line with which to call me. Can I connect to a remote PC using just a browser, and is there a resolution to the second problem using pcAnywhere32 or some other product?

Via the Internet

There are free tools available that provide remote desktop control over a network. One is Virtual Network Computing (VNC), available at www.uk.research.att.com/vnc/download.html. VNC can provide desktop access across platforms through a browser once remote users install a program called vncserver and set up access passwords. You maintain a Web page on a server and a port to which users connect. Users request support connections by filling out a Web form that links back to their vncserver program and makes it possible for you to connect to them with your browser.

Other options are a Web-based chat system or a bulletin board service for communicating IP address information to support personnel while online.

As a network architect at Houston-based Sprint Paranet, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Label switching hikes IP performance

BY ANDREW MALIS

In today's enterprise networks, a major goal is to use a single protocol that can successfully marry connectionless IP and connection-oriented ATM technologies. The Internet Engineering Task Force's Multi-protocol Label Switching (MPLS) specification, due out this summer, could be the best approach for meeting this goal.

Supersets of MPLS, which have been available for about a year, implement technology known as core label switch-

further functions to MPLS, including QoS and multiservice capabilities.

The available superset features follow the MPLS work within the IETF and will evolve to fully comply with the finished standard. The QoS and traffic engineering features that these supersets enable via core label switching are key to delivering connection-oriented IP services.

For example, core label switching supports the creation of connections for IP traffic. The technology accommodates the dynamic nature of those connections — such as constantly changing

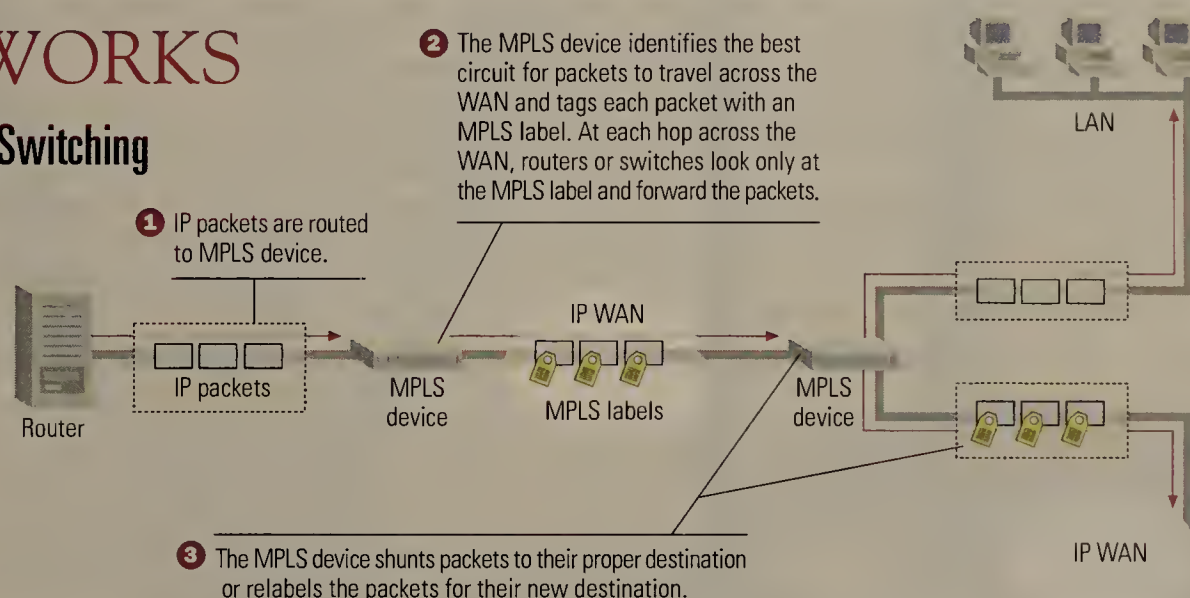
backbone transmission resources by explicitly routing IP traffic through their network. This is not possible with ordinary router-based networks because IP routing protocols simply follow the shortest path through the network without regard for available bandwidth, path redundancy or the need to avoid congestion points. Traffic engineering for IP is only possible by adapting connectionless IP packets to a connection-oriented backbone.

The IETF MPLS Working Group is in the process of specifying two methods of providing traffic engineering for

HOW IT WORKS

Multi-protocol Label Switching

The Internet Engineering Task Force's MPLS specification uses ATM's reliability, delivery mechanisms and QoS capabilities for use in large IP networks. MPLS defines label-driven connections for reliable and fast IP packet delivery in multivendor environments.



ing to provide quality of service (QoS) and traffic engineering capabilities in advance of the standard.

The MPLS specification, which harnesses ATM's reliability, delivery mechanisms, QoS capabilities and multicast features for IP networks, promises to be an important tool for delivering new connection-oriented IP services to customers.

In its initial version, MPLS specifies label-driven connections for reliable and fast IP packet delivery and multivendor interoperability. MPLS lets a router or switch tag each of its routing table entries and send that tag to neighboring devices. The tag lets MPLS routers or switches identify the next hop in a packet's path without having to perform address lookups.

The MPLS specification also will include the initial work for traffic engineering, also known as bandwidth management, which remains a key issue in the design of large core IP networks. After the initial set of specifications comes out, work will continue within the IETF to add

sources and destinations — not only by forwarding IP traffic over shared paths in a scalable way, but by enabling competitive services from service providers. Core label switching moves IP beyond traditional best-effort, hop-by-hop forwarding, which is not sufficient to support the real-time requirements of next-generation applications.

Core label switching works much like the Open Shortest Path First protocol, but routes circuits rather than packets. Because these circuits provide end-to-end guarantees, they allow for services such as voice over IP with absolute QoS, video applications, multicast and distance learning. Core label switching provides traffic engineering capabilities by enhancing routing protocols to carry additional link information. The technology also introduces signaling protocols, such as Label Distribution Protocol (LDP), into the IP network. LDP defines the standard format for tags.

Traffic engineering allows net managers to make optimal use of their expensive

MPLS: The first is based on LDP, and the second is based on enhancements to the existing Resource Reservation Protocol (RSVP). The original RSVP had a number of problems that prevented its use on WANs — particularly its lack of scalability, which restricted RSVP's use to LANs and campus networks. While the working group has been addressing many of these concerns by adding new capabilities to MPLS, many vendors prefer the LDP approach for traffic engineering. The jury is still out regarding whether the IETF will standardize both methods of traffic engineering or if it will only endorse LDP.

Malis is a consulting engineer for Ascend Communications' Core Systems Division. Malis is active in the IETF's MPLS Working Group and co-chairs the IETF's Internetworking Over Non-Broadcast Multiple Access Networks Working Group. He can be reached at andrew.malis@ascend.com or (978) 952-7414.

Gearhead — inside the network machine . Mark Gibbs

SWAP STANDARD WINDOWS SCREENS FOR SOMETHING USEFUL

If you're running Windows 95 or 98, every time you fire up or shut down your PC you see splash screens, and frankly, Gearhead is sick to death of the clouds and the flying Windows logo. You have another option: Get rid of them.

Open the file `c:\msdos.sys` (it is usually in the root but look around if it isn't), and add the line `logo=0` (that's "zero" not "oh") at the end of the Options section. Voila! No more wretched clouds and flying Windows logo when you start.

Note: `msdos.sys` is a read-only, hidden system file, so you'll have to ensure that Windows Explorer is configured to show it (use View\Folder Options on the Explorer menu). Alternatively, you can use the `attrib` command under the DOS shell to change the attributes of the file, thus: `attrib -r -h -s c:\msdos.sys`.

Also, under Windows 95, you must have a file named `logo.sys` in the root of the C: drive, otherwise the default logo will be displayed.

(I know, I know, ridiculous logic, but it has nothing to do with Gearhead.)

Finally, this setting can be changed



in Windows 95 using Microsoft's TweakUI program (see www.microsoft.com/windows95/downloads/default.asp).

But rather than having nothing displayed, wouldn't it be more useful to have, say, a company logo or the machine's name or ID displayed on start-up? Well, you can.

And you can replace the "Please wait while Windows is shutting down" and "It is now safe to turn off your computer" screens as well.

These three screens are actually bitmapped images that reside in the files `c:\io.sys` (the clouds), `c:\windows\logow.sys` (the "Please wait . . ." screen), and `c:\windows\logos.sys` (the "It is now . . ." screen).

Changing the latter two is easy. You

find the files in the `\windows` subdirectory and replace them.

Note: Whatever you do, don't mess with the `io.sys` file — that is actually DOS (ugh) and starts all the Windows subsystems.

So to replace the built-in image, create a new image file, `c:\logo.sys`, and Windows will use that as the start-up screen instead.

Now you're probably wondering what the format of these image files is. Well, they are standard Windows bitmap files (the .bmp type). You can edit them by opening the .sys files (except for `io.sys`) directly from a graphics program.

Alternatively, you can also change the file type to .bmp and then double-click on the file in Explorer to launch the default editor for that type (which will usually be Microsoft Paint).

Note: You can also hold down the shift key and right click and the pop-up menu will contain "Edit with" so you can select which image editor to use.

Specifically, the image files are Windows bitmaps with 8-bit color

depth (256 colors) and 320x400 pixels — any other combination of attributes and the files won't be displayed. "Hold hard," you might be saying, "that's an odd aspect ratio."

(All of you who did say that can award yourselves a point for extreme cleverness.)

The standard aspect ratio of a screen is 4:3 but Windows stretches the 320x400 pixel image to fit (again, there's no good reason that Gearhead knows of).

So start with an image that is 640x480 pixels or 320x240 pixels and resample it to the target size. If you use an image with 16-bit or higher resolution color, make sure you convert to a 256-color palette, otherwise your new screens won't work.

Recommended reading: *Windows Annoyances* and *Windows 98 Annoyances*, both by Karp, published by O'Reilly, and *Windows 98 Secrets*, by Livingston and Straub, published by International Data Group.

Lookin' good? Let Gearhead know at gearhead@gibbs.com.

NetworkWorld Fusion Spotlight

News, tips and tools from our Web site

Hey, look! We're on TV!

At the recent NetWorld+Interop, we got to play gritty, streetwise journalists on TV, thanks to a videoconferencing system from White Pine Software.

White Pine rigged up a three-station videoconferencing setup. We had a client running in Fusion Editor Adam Gaffin's office in Framingham, Mass., talking to two clients at White Pine's booth at the show via a White Pine

MeetingPoint server.

During most show hours, the camera in Framingham and one of the cameras at the show were on, letting us stream a "floorcam" across the 'Net.

Over our T-1 connection in Framingham (and a 10M bit/sec show net), the CU-SeeMe video was very clear — staffers kept popping into Gaffin's office to stare at people walking across the show floor in front of the White Pine camera, 2,000 miles away.

Once a day, we used the system to do live broadcasts. Online Reporter Sandra Gittlen showed up with some *Network World* columnists and others to discuss what was hot (or not) at the show.

And here's where we ran into major problems. The streaming component currently only works with Microsoft's Windows Media Player — more specifically with the latest version of it.

Maybe we've been spoiled by RealNetworks, whose various incarnations of RealPlayer have always installed themselves flawlessly, but we were quite surprised at all the problems our staffers had getting the latest Windows Media Player to work.

The player wouldn't work at all with Netscape Communicator 4.X. One reporter could get video but could never get the sound to work. Only one person here reported being able to watch the

streaming broadcasts.

We can't wait for the RealVideo version that White Pine is promising.

Help Desk: Outlook

This week, Ron Nutter helps out a user with this problem: He's running a remote access server on an NT box so remote users can check their e-mail via Outlook 97 and Internet Message Access Protocol 4. The problem is that Outlook runs incredibly slowly. Is this a protocol problem or is there an NT service he should be adding?

DocFinder: 3028

Download of the week

If computers and operating systems were perfect, they would never crash. Unfortunately, we do not live in a perfect world. Hence the need for a tool such as Attune, a new early-warning

system for PCs from Aveo.

Attune is an application that runs in the background on Windows 95/98 machines, running Internet Explorer 4.0 or higher with at least a 200-MHz CPU.

When Attune notices a conflict or problem, it issues an alert, and downloads and installs any available patches.

Attune is a free service. You can download the software and other nifty tools from the Fusion Download area at:

DocFinder: 3029

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. DocFinder: 2450

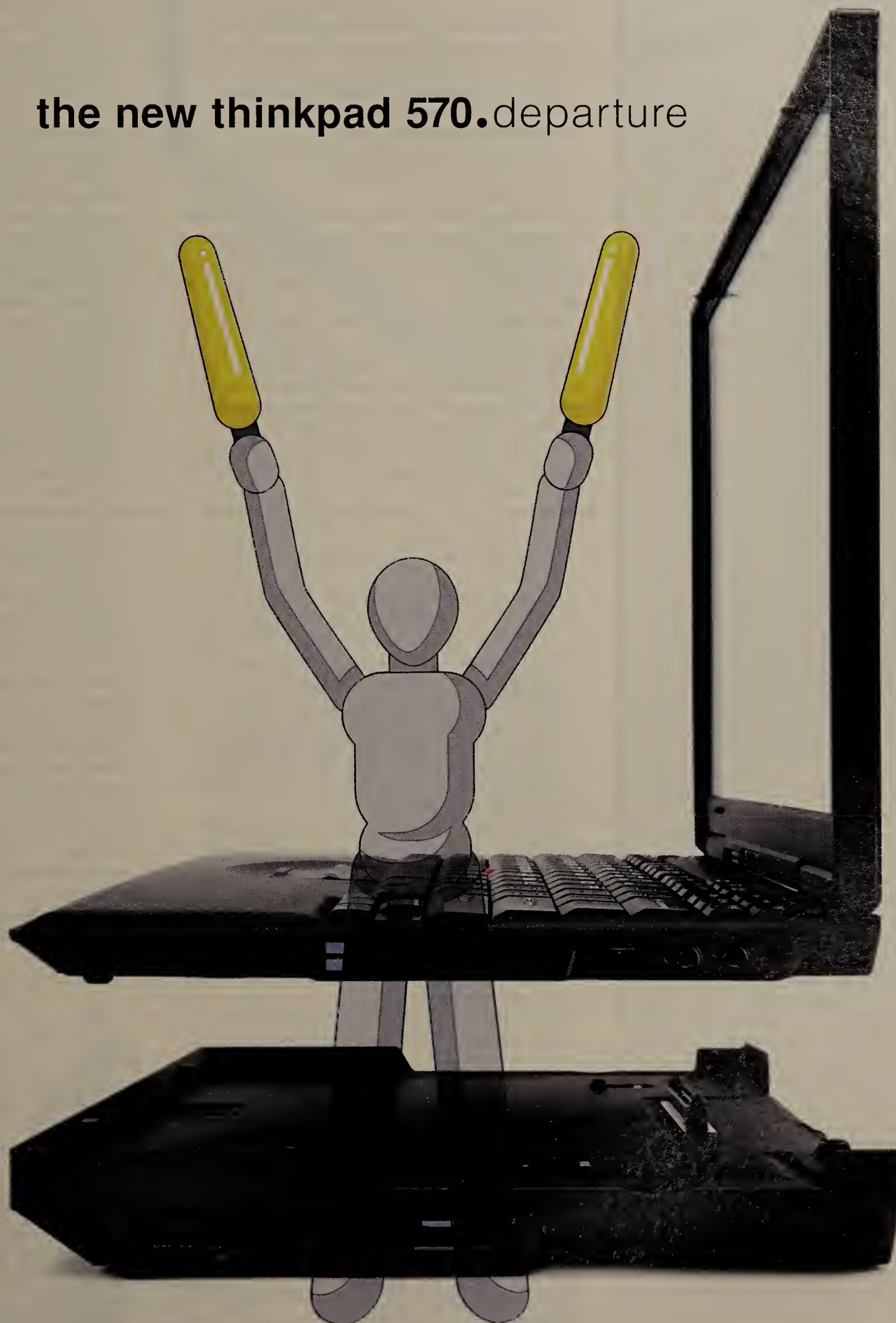
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Editorial Insights

OS debate shows there's life outside your Windows

With all the talk about Windows 2000 and its 35+ million lines of code-to-come, it's easy to get the impression that there's only one operating system choice these days.

But nothing could be further from the truth, as our feisty Operating System Showdown at NetWorld+Interop 99 illustrated. Executives from Novell, Microsoft, Red Hat, The Santa Cruz Operation (SCO) and Sun laid out their strategies and punched holes in those of their rivals.

Some great sound bites included when SCO's Tamar Newberger referred to her

competitor's products as "NetWare, beware, shelfware and nowhere," and when Sun's Brian Croll asked Microsoft's Jim Ewel if the Windows 2000 development effort could now be officially dubbed a "software project from hell." Ewel gave as good as he got, though, pressing Croll to explain why some high-level customers had abandoned Solaris (it turns out they hadn't, according to Sun) and hitting Erik Troan of Red Hat on Linux performance problems.

Theatrics aside, the debate highlighted the vibrancy of competition in the market and the real differences in strategies. While Windows 2000 is being designed as a general-purpose operating environment for networking, applications and Web roles, Novell is positioning NetWare as the best platform for corporate-class Java applications and as the engine for specialized network functions such as caching.

The Unix vendors are banking on scalability, with an eye toward a 64-bit future, while Linux represents not only a technology option, but a political choice as well.

The debate also highlighted Microsoft's vulnerability. Like George Lucas, whose *Phantom Menace* opened last week, Bill Gates has a lot to prove and outlandish expectations to deal with in delivering Windows 2000. Microsoft can't afford to stumble because the Java movement is breaking traditional links between applications and a particular operating system, and opening new market windows for competitors.

You can find the full transcript of the Operating System Showdown on Network World Fusion (www.nwfusion.com, DocFinder: 3030). Not only will you enjoy perusing this one, you'll get a better sense of where all these dynamic companies are going.

What's next? A Showdown on convergence among the major network companies such as Cisco and Lucent at N+I Atlanta.

— John Gallant
jgallant@nww.com



Message Queue

TRICKS OF THE TRADE

The advice in your article "Taming the trade show beast" (May 3, page 63) was right-on. Here are some additional tips:

- Make a list of the vendors you work with or want to work with; visiting their booths should be your top priority.
- Check with everyone in your department, including managers, and get their questions for those vendors.
- Visit the vendors with an agenda, and insist on talking to an engineer rather than a salesperson. As soon as you start asking hard and specific questions, the salespeople will often automatically shunt you to the engineers.

Relationships with engineers and product managers will help you a great deal in using the vendor's product at your company. You will get better technical support in some cases. You may even get free or reduced prices on equipment or be selected to participate in beta trials.

Duncan Brown
Senior network administrator
The Forum Corp.
Boston

Regarding your article on making trade shows worthwhile:

I attend NetWorld+Interop for the training sessions. One two-day tutorial and a one-day workshop provide background information from the protocol designers that unmask marketing hype. Attending the sessions still allows for two days on the show floor.

I am amazed that companies spend so much time and effort to exhibit and then populate their displays with "booth babes" and "sales droids" who are clueless. I never sit through a canned presentation unless I want to get off my feet.

My best trade show experience was a conversation with a Cisco engineer who in 5 minutes gave me information that saved my company more than the cost of the trip.

Daniel Cotts
Fairfield, Iowa

Send letters to nnews@nww.com or John Gallant, editorial director, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

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• More letters about trade shows and other topics.

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THE BLAME GAME

Regarding Mark Gibbs' "Backspin" column on the blame being placed on computer games as a catalyst in the high school shootings in Littleton, Colo., and West Paducah, Ky. ("Blaming the business," May 3, page 82):

As an IT professional, I spend my working life around computers, the Internet and many people with the same affection for gaming that I have.

And sure, sometimes when I'm at home, I throw in the latest "Doom" clone and blast my way around cyberspace — and enjoy it. As a matter of fact, in college I played "Duke Nukem" for hours until my thumbs went numb. If it weren't for the months I spent learning how to hook up my first PC network (just so my roommate and I could play "Doom"), I wouldn't be in the field I am today.

What do you know — a success story associated with the "violence-riddled" world of computer gaming.

But I've never walked into anywhere with a loaded shotgun and pipe bombs and opened fire on innocent people, nor have I ever felt the need to.

I love destroying my roommate in a game of "Quake." That's as far as it goes, though, because I know the difference between right and wrong.

Objectively I can say that yes, perhaps the games the shooters played did fuel their hatred and glorify violent behavior. So did the images, movies and books on Hitler and World War II, a product of our society as well. But to take it as far as they did, there had to be something seriously wrong with them as people.

You can't put full blame on computers and the Internet, society or even their parents. It is simply a combination of everything that is in our world — a world filled with things far worse than any video game can present. Unfortunately, there's no reset button.

Lucas Kuhlmann
Lead IT analyst
Principal International
Des Moines, Iowa



INTEROPERABILITY AND STANDARDS ARE KEYS TO VPN SUCCESS

At NetWorld+Interop 99 last week, virtual private networks (VPN) were the hot topic. You could not turn around without tripping over a VPN vendor or VPN presentation.

There's a compelling argument for replacing your private network: Sharing the cost of leased lines in a public network, such as the Internet, can cut monthly recurring costs by an order of magnitude. Pull out your leased lines, stick in an Internet connection, and you're on your way with money to spare.

The only glitch is that darn security problem: Using public networks for sensitive corporate data is asking for trouble. (Well, there are other problems, such as a lack of service-level commitment over the Internet, but we'll save those for another time.) VPNs, which are now synonymous with encryption more than anything else, are the magic bullets that kill security objections.

Judging by the excitement and interest I saw at Interop, everybody wants a VPN. The show featured VPN hot spots, VPN labs, VPN demonstrations, VPN tutorials and — of course — VPN vendors. I haven't

seen this much hype since ATM hit the shelves.

If you're thinking of installing a VPN, carefully consider your choice of vendors and standards.

As in all areas of networking, no single vendor has all the best answers to your problems. Most VPN deployments will include client-to-site and site-to-site networks; some will be true extranets with multiple trading partners connecting over the Internet.

Interoperability is far from a given in the VPN world, so you must be careful to qualify vendors based on their commitments to 100% interoperability. It's painful and expensive to build interoperable products. Nevertheless, we expect high levels of interoperability in all other aspects of our network. How often do you even think about whether all your TCP/IP devices can talk to one another?

I've found that mixing and matching vendors and equipment is crucial to building a best-of-breed VPN. This may change, of course, but for now there is no one-stop shopping.

Standards are the second key area for VPNs. It's important to make sure your network doesn't rely on

obsolete or proprietary protocols. Simple Key Management for IP, Point-to-Point Tunneling Protocol and Layer 2 Forwarding are widely available but are heading toward obsolescence; deploying them in a VPN secured environment now would be a major mistake.

The Internet standards to look for are included in the IP Security suite: Encapsulating Security Payload and Authentication Header and their companion protocols — Internet Key Encryption, Internet Security Association and Key Management Protocol. If absolutely necessary, Layer 2 Tunneling Protocol might be needed for the client side of the equation to handle certain kinds of addressing issues.

Focus on finding a set of vendors — not just one — that is committed to interoperability. Add in the most appropriate and timely set of protocols for your network, and you'll have a significant head start toward a secure and supportable VPN for your enterprise.

Snyder, a Network World Test Alliance partner, is a senior partner at Opus One in Tucson, Ariz. He can be reached at jms@opus1.com.

CONVERGENCE WILL ARRIVE SOONER THAN YOU THINK

Convergence is one of those words that has taken on multiple meanings in our industry. Depending on your perspective and the context of the conversation, convergence can refer to the merging of computers and communications; voice and data; TV, telephone and computer; or packet and circuit-switched voice.

For consumers, convergence will mean pervasive computing — the merger of the computer with the telephone, TV, Internet and every imaginable appliance. This emerging marketplace will take off in 2002 and will affect us all. If you think you have problems managing your network today, just think about a network that has a billion devices on it, and having to synchronize software revision levels and security across those devices.

For business users, convergence will involve the merger of packet-based multimedia communications, virtual private networks (VPN) and computers. Small and mid-size companies will experience convergence first. Voice key systems and small PBXs will be under direct attack from new integrated voice services and Internet access servers that use LANs to interconnect with desktop PCs and/or telephones. Such devices are available today, although they are still in their infancy. The major problem is that telephony value-added resellers (VAR) don't know data, and data VARs don't know telephony. However, this problem will resolve itself by 2001.

Large enterprises will take a more conservative approach to convergence, due largely to the technology's questionable scalability and reliability. Large enterprises do not capriciously replace existing PCs, LAN switches and PBXs. With the exception of branch offices, large enterprises won't be ready for conver-



gence until 2003.

It will take even longer for convergence to affect service providers. The Internet, because of its indeterminate architecture, will not be a major transport mechanism for voice and data convergence. Instead, the service providers' VPNs will be the major transport vehicles, thanks to their high bandwidth, inherent determinism and implicit security. VPNs will move into the business market next year and reach the consumer market by 2003.

The service provider market will be the battleground for the convergence of packet and circuit-switched voice. Packet voice can be implemented using IP or ATM switching. Carriers and post, telephone and telegraph administrations are opting to implement packet voice via ATM; ISPs and the more aggressive service providers are choosing IP. However, most carriers and PTTs are hedging their bets by also beginning to implement packet voice over IP in limited parallel networks and as penetration networks into competitive geographical areas.

The carriers and PTTs are being conservative because of the large installed base of circuit-based switches. Surrounding these switches are operation

support systems, billing systems, network management systems, intelligent-network call-feature systems and signaling systems. The major convergence issue is not packet vs. circuit switching, but operational systems-level mediation today and the ultimate replacement and upgrade of all network support systems.

Mediation equipment and software will allow coexistence with, and then migration to, a packet-voice world from the existing circuit infrastructure at a controlled pace, rather than by "flash cut."

Some service providers argue that packet-switch replacement is required in order to compete with next-generation service providers and ISPs. Others contend that business issues, such as installed equipment depreciation and labor retraining costs, far outweigh technological or competitive rationales.

I believe that business issues will win out and that coexistence through mediation will be the primary form of convergence for service providers until 2005. By then, the next-generation support infrastructure systems will have evolved to the same point as today's systems, and for many years, hybrid packet/circuit-switched service provider environments will be the norm rather than the exception.

Convergence is not a simple subject. It spans all forms of computer and communications technology and will be a key force in productivity improvement and cost reduction. From LAN-based PBXs to next-generation service provider switches and support systems, convergence will define our industry's continued growth in the next decade.

Dzubeck is president of Communications Network Architects, Inc., an industry analysts firm in Washington, D.C.

Using common tools and platforms across the organization is not essential but will help reduce costs for training and support. In choosing these management intranet enablers, it is important to achieve the right balance between sophistication and the time required to learn the tools. A simple approach that doesn't require a lot of upfront training or hiring of specialized resources is best, at least at first.

Content standards are required. Existing documentation standards can be extended relatively easily to cover Web-based publishing of procedures, configuration data, knowledge bases and so on. If such standards don't exist, this is a great time to put some in place, as the major migration to the Web takes place. Don't get carried away, however. One of the reasons the Web works so well is that it relies on a relatively small set of interface standards that promote innovation rather than constrain it.

- **Set up a security architecture.** Enable remote, secure access to the management intranet for support staff and managers using Secure Sockets Layer and/or HTTPS and virtual private network connections. Consider how many levels of management information access you'll need in your environment and organize your Web servers to support each level. Begin to explore models for secure interaction with management systems in other enterprises that your organization does business with. Managing systems that are shared among enterprises in the same value chain is a major challenge being brought on by the era of Web commerce. As with any extranet, you'll need to come up with policies regarding what management information you want other organizations to be able to see, and set up security measures that make only that information available to your partners.

- **Manage via the browser.** Most enterprise-level management systems already support browser access to most functions. Start using the browser interfaces you already have and consider selectively upgrading other core management systems to versions that support browser access. Going forward, almost all new management tools will be designed to be used primarily via a browser. In future purchases, favor tools that can be used entirely via a browser. Consider migrating from existing telnet-based or SNMP-only device management to direct browser access to the device's built-in configuration and trouble-shooting features. This is something being offered by most network device makers, including Cisco, 3Com and Nortel Networks, in their newest products. As your network devices turn over and are upgraded, the new models will all come with embedded Web servers and a fairly complete element manager packaged inside.

- **Stitch it together.** The next step is to begin extending and integrating the management intranet. Take your most important home-grown databases of configuration, user and supplier data, as well as any knowledge bases or regularly generated reports, and make them accessible via the management intranet. Use HTML to integrate reports from different sources and to make them more readily accessible. Create navigation pages and indexes of these information resources. Make it easy for different technical-support people to customize the pages and indexes to their own needs. For example, provide

a master page that support people can customize to their liking. Or go a step further and build different templates for each support group, complete with links to appropriate sites. Similarly, create home pages for different regions, sites or parts of the organization. Make sure you exploit the simple utility of a search engine, which will work well within the limited domain of an enterprise management intranet and make it easier to find information.

Management tool vendors such as Cisco and Tivoli already are using hyperlinks and XML exchange to improve the way management tools work together. For frequently used tools and major enterprisewide systems, you can begin to improve navigation by creating custom hyperlinks, which will reduce the number of clicks it takes to move among primary pages. Also, you can begin to tie different kinds of resources together with scripts that, for example, automatically populate forms with information from databases.

In 18 months or less, Common Information Model (CIM) interfaces will be widely implemented on most management tools. At first, the main effect of CIM, which is part of the Web-Based Enterprise Management (WBEM) initiative, will be to harmonize the naming of managed objects across different tools. The tools will then be able to more easily use data from other tools to provide a complete picture of the environment. It will also be easier to pull summary data out of multiple tools via the CIM interface and publish them via the Web.

Adopting a browser-based approach to management tool and database access should offer a number of benefits. Remote access via the Internet will be a welcome change for level three gurus, the most senior personnel who get called in to the operations center late at night to fix problems. Distribution and updating of management tools is easier when there are no client-side components to worry about. With

browser and Web protocols such as HTML and XML being used as integration points rather than management platforms, management tools can be easily spread out across multiple servers, instead of having to coexist with a central management platform on one server. External providers can actually supply some tools entirely as services. Companies such as NetOps and Candle are pioneering this application service provider approach to net-

work management.

- **Extend out.** The real benefits of Web-based management are realized when you begin to link external resources to your management intranet, creating a management extranet. Navigation pages for each segment of your support team can be populated with links to just the right set of vendor-support Web sites that fit the technologies each segment deals with. Press your service providers to publish

monthly service-level reports in HTML. You can try out Web-based customer network management interfaces for your key frame relay and managed network services.

A big step up in applying Web technologies is to create new interfaces for communicating with your customers — meaning end users. You can make a portion of the management intranet visible to users through your enterprise intranet. The help desk can offer Web-based submission of problems and change requests. It can also publish "live" summary data of network performance and resource availability. Web-based publishing of service-level reports, chargeback analysis and project status will improve your relationships with your internal clients. You can also deliver tools that enable users to help solve their own problems. Such self-help facilities range from simple FAQ files and password reset capabilities to pull models for software updates.

- **Automate administrative functions.** The Web is much more than just a publishing medium. It is now a platform for the creation and delivery of Web-based services. Ultimately, as businesses adopt e-business practices, so will IT departments. This means moving business processes to Web-based information sharing and linkage with customers and suppliers. In a similar fashion, enterprise IT departments can significantly streamline their work processes by moving away from paper and toward Web-based direct entry of requests and orders. IT departments should also be leaders in adopting electronic commerce approaches to purchasing. They should use Web-based interfaces to configure and order new hardware, software and services.

- **Evaluate major new investments.** Almost all management software vendors are quickly incorporating Web technologies into their products. One of the beauties of adopting management intranet architecture is that it does not require you to drop any of your existing systems.

The use of Web-based management, however, does give you new options. It makes it easier to integrate best-of-breed products with each other or with a major enterprise framework. There are new Web-from-the-start companies in the market that should be looked at. Entirely new management systems will be needed to handle the scale, complexity and demanding service levels of electronic commerce and e-business.

It may be a bit early to make major commitments to new products that will play a key role in your enterprise management strategy. But, as with all things having to do with the Web, new approaches will evolve rapidly and begin to mature sooner than we expect. Once we're done with Y2K, it will be a good time to re-evaluate options and determine the best enterprise management strategy for the Web-based management era.

Herman is a vice president at Northeast Consulting, a Boston-based firm focused on helping businesses profit from the Internet and the Web.

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• For more on the technology and philosophy behind management intranets, check out the white paper *"Using Internet Technology to Integrate Management Tools and Information,"* written for Cisco Systems by Northeast Consulting's James Herman and Theo Forbath.

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■ **New network devices will come with embedded Web servers and a fairly complete element manager packaged inside.**

SPANNING TREE IS STILL WITH US

So long as Layer 2 switches and VLANs are around, you'll need to know more than you probably care to about the Spanning Tree Protocol.

BY STEPHEN LEWIS

Is your network in a state of flux, with a mix of Layer 2 switches supporting some segments, and Layer 3 and perhaps Layer 4 devices handling others? Maybe you have virtual LANs implemented in some of your net. If this sounds familiar, add Spanning Tree Protocol to your list of things to think about.

It's not unusual for an organization to have Layer 2 switches with 10M or 100M bit/sec links to local users and 100M or Gigabit Ethernet uplinks to a Layer 3 or 4 switch. In this scenario, the Layer 2 segments are essentially bridged networks. If the bridged nets have redundant links to other LANs, you need to employ the Spanning Tree Protocol to ensure these links function properly, with one in backup mode to the other. VLANs compound the problem because each VLAN essentially represents a bridged network. Therefore, you need to configure a separate spanning tree implementation for each VLAN.

As you graduate to Layer 3 switches, the spanning tree problem disappears because you're dealing with routed, not bridged, networks. Your goal should be to rid yourself of spanning tree by going to fully routed nets based on Layer 3 or 4 switches.

We brought various switches into our lab to see if there were any similarities in the way vendors implement the Spanning Tree Algorithm that could translate into configuration advice. We looked at nine switches from five vendors and found almost as many variations as the number of vendors. Bottom line: You'll have some work to do to ensure that spanning tree is enabled properly on your various Layer 2 switches.

Before we get into the details, it's worth going over the background. The Spanning Tree Protocol, officially part of the IEEE 802.1D standard for media access control bridges, is a link management protocol. Any device that performs Layer 2 switching uses spanning tree.

In a network with redundant connections between bridged LANs, one connection is always in the forwarding position, passing all traffic. The other is in a standby, or blocking, position. If the

first connection goes down, spanning tree is the algorithm that learns about the disruption and ensures the backup connection kicks in.

Without spanning tree in place, it's possible that both connections may be simultaneously live, which could result in an endless loop of traffic on the LAN. That situation occurs because in a bridged LAN there has to be only one path from Point A to Point B. If there's more than one path, it's possible — even likely — that the same packets will be shuttled back and forth in different directions because of the way internal bridge or switch tables are populated (see graphic).

Spanning tree is enabled by default on most vendors' switches, but you'll likely have to change some of the settings. Changing settings can be a difficult task because spanning tree is quite complex; the 802.1D standard is 378 pages long. However, adding switches to a network without reconfiguring them can lead to slow user logons, failed connections and the unauthorized movement of users between VLANs.

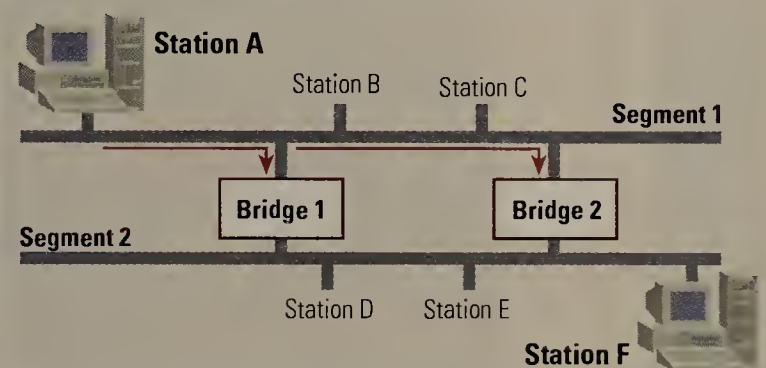
Based on our tests of switches from Cisco, Nbase-Xyplex, Foundry, Olicom and Anritsu, it's clear that most vendors implement spanning tree differently. For example, some vendors let you enable or disable spanning tree on an individual port basis, so Port 5 may have spanning tree enabled, while Port 6 doesn't. However, all the vendors at least seemed to have the same default spanning tree filters.

Client-side problems

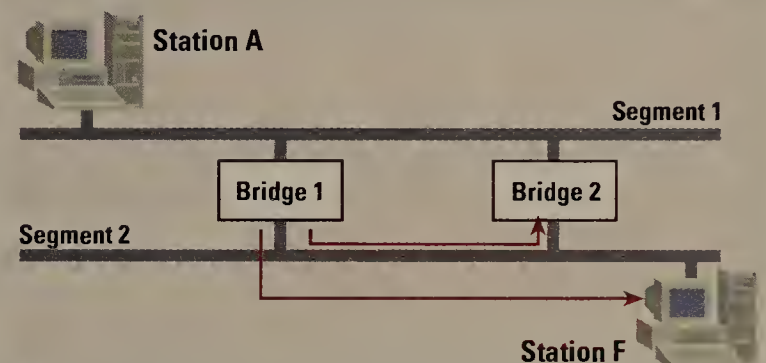
One overall problem with spanning tree is that it's a slow protocol and often can't keep up with the speed of today's networks. For example, to ensure that data goes where it's supposed to, spanning tree employs bridge protocol data unit (BPDU) packets, which contain information on ports, addresses, priorities and costs. But some Novell and Microsoft clients connect to a switch port so quickly that spanning

Why spanning tree is necessary

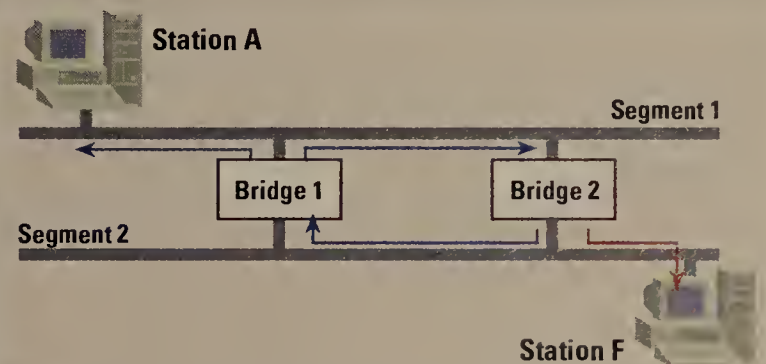
In networks with multiple transparent bridges, spanning tree prevents the kind of infinite traffic loops shown below.



1 Imagine two segments connected by two bridges. Station A sends a packet to Station F. Both bridges capture the frame and add Station A to their internal tables.



2 Because the bridges don't know where to find Station F, both bridges retransmit the packet onto every segment except the one from which it came. Station F receives the packet from Bridge 1 first. However, Bridge 2 also receives the packet on Segment 2. It therefore thinks Station A has moved to Segment 2, and updates its tables.



3 Bridge 2 also transmits the packet it originally received from Segment 1 to Segment 2. Station F receives the same packet a second time — a potential problem. Bridge 1 sees the packet coming over Segment 2. It updates its tables to show Station A has moved to Segment 2 and, because it still doesn't know where Station F is, retransmits the package over Segment 1, thus completing the first cycle of a traffic loop.

SOURCE: OPTIMIZED ENGINEERING CORP., MOUNTAIN VIEW, CALIF.

tree doesn't have time to send the BPDU packets. That situation creates the possibility of packets being shipped to ports where they shouldn't be going, circumventing the protection that spanning tree is intended to provide.

Similarly, a VLAN user who is

moved from one switch to another may experience delays while the new switch port learns the user's new location. In large bridged networks, it's possible for enough delay to occur that data is lost and must be retransmitted. And broadcast traffic on a bridged network always has the

potential of slowing down the network when protocols such as spanning tree react too slowly.

When we looked at spanning tree in the lab, our Novell clients failed to connect with some vendors' switches. The only way we finally got connected was by disabling spanning

tree on the switch ports that connected to the Novell clients in question. We also at times saw NT Server arbitrarily reboot.

On their Web sites, Microsoft and Novell have fixes for certain switches that experience these problems. The fixes usually involve disabling the port, as we did, or setting a registry parameter that controls the timing for the client to look to the next server.

Continued on page 48

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GET TO LAYER 3 AND KISS SPANNING TREE GOOD-BYE

Why would you buy a Layer 2 switch that requires spanning tree to support LAN bridging when you could get a Layer 3/Layer 4 switch that is capable of port-level routing with no spanning tree required? In a word, economics. Layer 2 switches are less expensive than Layer 3 and Layer 4 switch routers.

To achieve the greatest benefits in terms of network segmentation, you would most likely have to replace all the Layer 2 switches on your network with Layer 3/Layer 4 switches. That move may not be feasible, but you can start by replacing them gradually.

As your network grows or is upgraded, start buying Layer 3 switches and implementing per-port routing. Maybe you already have Layer 3 switches, but you're employing them as Layer 2 devices. Again, make the leap to Layer 3.

Some vendors say that using spanning tree in a Layer 2 bridged network is essentially the same as having Layer 3 routing switches — don't believe it. Chances are any vendor that makes such a statement doesn't sell a Layer 3 switch.

— Stephen Lewis

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Extreme Summit 1 TM	None	8	\$2,249
Foundry Turbolron8 TM	None	8	\$1,874

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Continued from page 46

Disabling spanning tree on an individual port basis shouldn't cause any problems, as long as you disable only client ports, as opposed to the main uplinks. And disabling client ports is certainly easier than mucking with

timing controls in the registry.

Our Windows NT workstations running Microsoft's TCP/IP client didn't have any connection problems throughout 150 logon and connection attempts in DHCP mode with spanning tree enabled. Still, the NT support Web page mentions some potential

DHCP spanning tree problems. The support Web page suggests disabling the client spanning tree port to avert problems.

Zeroing in on the problems

We worked with engineers from Netcom Systems, maker of the

SmartBits performance analyzer, to observe a client logging on and off NT and NetWare servers — a process spanning tree is supposed to monitor.

We configured a SmartBits analyzer to send 1,000 packet/sec with a broadcast address from one SmartBits port module to a port on Switch 1. We configured the SmartCounters on the Netcom device to monitor the time between when the sending port started shipping packets, and when they began arriving at the receiving port. We did this for three different ports per switch and averaged the times.

The average time with spanning tree disabled was about 4 seconds slower than when the protocol was enabled. This result is about as expected in a small network; the delay could be greater in a larger one.

In fact, a 4-second delay in a large network could cause trouble for users trying to connect to server resources. For example, if a client is trying to log on to a DHCP server and is subject to the 4-second delay, the client may not be able to get an IP address and, therefore, won't be able to log on to any networked servers.

Next, we tried some real-world tests and garnered essentially the same results.

We powered up workstations on Switch 1 and began logging on to servers connected on Switch 2. We were unable to log on through some switches. Novell recommends changing the timing logon within the client. As noted above, in a large network with thousands of nodes, that's not acceptable. Disabling spanning tree on a port-by-port basis is much simpler.

Long-term, an even better solution from an administrator's point of view is to migrate to Layer 3/Layer 4 switches and avoid VLANs. There's no reason to revert to bridging now that it's entirely feasible to build a routed, wire-speed network using Layer 3/Layer 4 switches.

Short of that, you can simplify your life if you stick to one vendor's product line when using spanning tree so you won't have to learn the vagaries of multiple vendors' implementations. Or if vendors could find a way to put redundant links on instant standby, it would eliminate the need for spanning tree loop protection — then spanning tree could join Arcnet in the network history books.

Lewis is technical director for the SIGNAL Technology Solution Center (TSC). Also contributing to the review were TSC Tiger Team members James Bak, Steve Wilson and Erik Leigh. SIGNAL, founded in 1987, is an IT services provider in Fairfax, Va. (www.signalcorp.com). Lewis can be reached at Tech_solutions@signalcorp.com.



Updated!

Essentials of Network Technologies

and their Practical Applications

Understanding TCP/IP:

Implementing the Protocols of the Internet

PROGRAM OVERVIEW

The networked world is growing ever more complex. Each new technology promises to fill a specific need with greater speed, better quality and at a lower cost. Each brings with it a bewildering array of new terms and acronyms ... a new language, in effect. The result is confusion.

KEY BENEFITS OF ATTENDING

Grasp the fundamentals of transmission systems from analog to digital, from twisted pair through fiber optics and from wired through wireless

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Get a handle on LAN networking: Bridges, Hubs, Switches and Routers

Understand Voice over Frame and Voice over IP: Does it make sense to talk over your data network?

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The CONTEXT Corp.

PROGRAM OVERVIEW

TCP/IP has become the standard you must be well versed in if you work in an Internet- or intranet-centric environment. An in-depth and clear comprehension of TCP/IP is essential for network administrators, analysts and PC support staff who need to understand the practical applications of this ubiquitous protocol — not just the theory behind it.

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- Understand how IP-based routing works
- Learn how you can integrate the application protocols, such as TFTP, FTP, TELNET, SMTP and HTTP into a TCP/IP environment
- Understand the operation of SNMP, the Internet standard for network management

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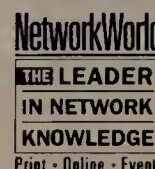
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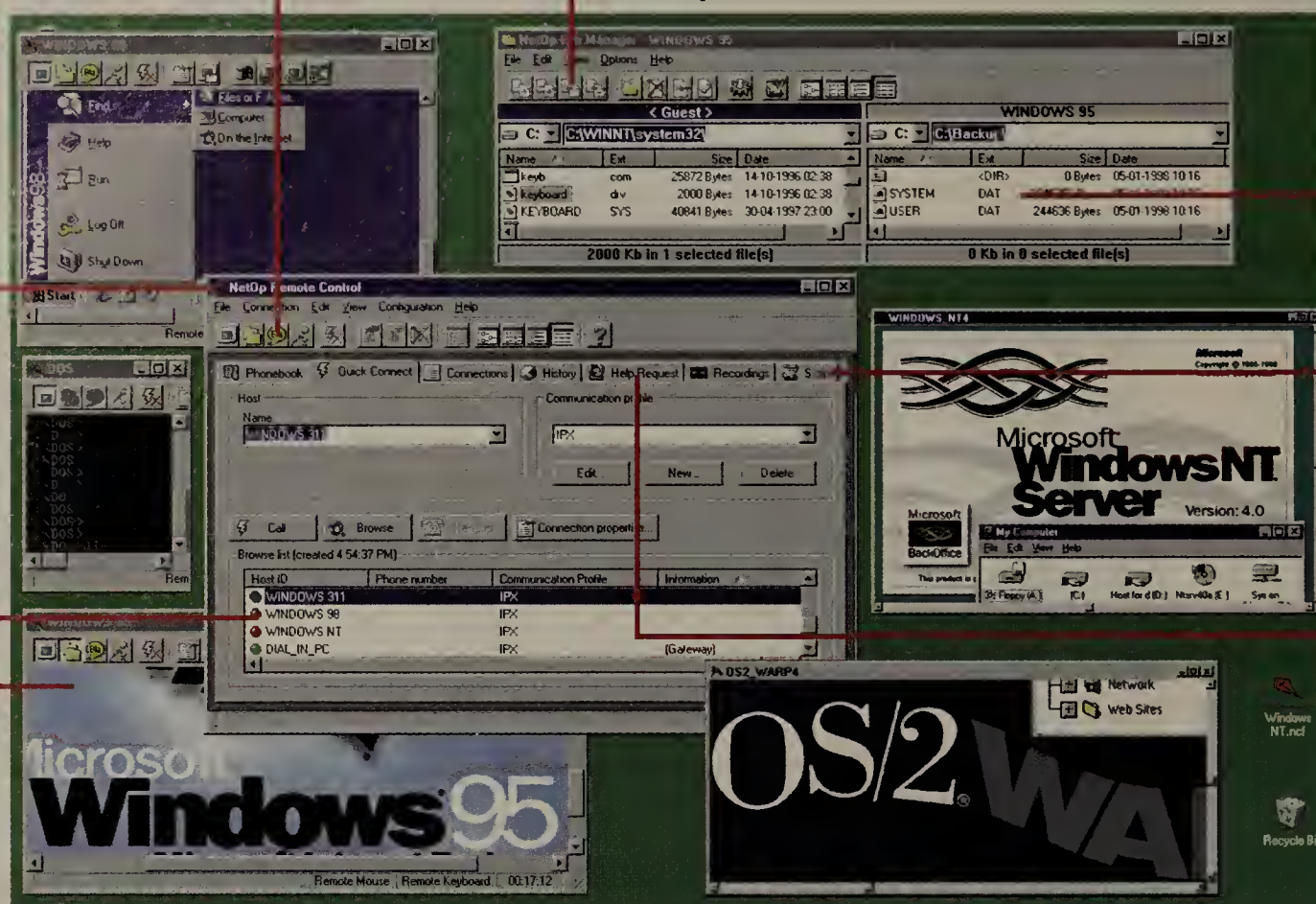
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Review

TEST-DRIVE YOUR NETWORK DESIGNS

Four network simulation tools make it easier to allocate bandwidth judiciously and identify impending overloads.

The days of overengineering for bandwidth are numbered. Few companies can afford to throw extra megabits per second at a project when the budget calls for accurate, robust and economical network designs from the start.

To help you stay lean and mean with confidence, we put four network simulation products through the paces and found this year's models are easy to use and accurate, and don't require a Ph.D. to run.

All performed well, though MIL 3's IT DecisionGuru outperformed the rest and earned our World Class Award with a near-perfect score. IT DecisionGuru delivers the whole package: accuracy; good performance; customization capabilities; superb documentation; and, except for some quirks with the license manager, easy installation.

For network managers with a smaller budget and less-demanding simulation needs, NetCracker Technology's user-friendly NetCracker Professional 2.0 fits the bill. NetCracker combines presentation and drawing tools with a simulation engine.

CACI's Comnet Predictor and Baseline 1.1 left us with mixed feelings. While the simulation engine is robust and the results we obtained were useful, the package felt a little dated. Some of the terminology, such as "network node" and "processing node," is ambiguous, and the graphics don't stack up to those of the other products. We hope CACI's revised Predictor 2.0, still in beta during our tests but shipping this month, will resolve some of these shortcomings.

Analytical Engine's NetRule 2.0 is the only product we reviewed that's written in Java. NetRule suffered slightly in the performance category because of the interpreted nature of Java. NetRule doesn't have the depth of features or extensive protocol libraries of IT DecisionGuru or NetCracker, but it doesn't cost as much either.

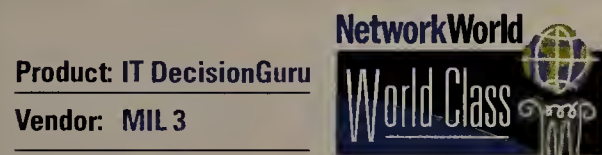
SMARTer than the average simulator

Network simulators typically use one of two simulation methods: discrete event or analytical. Discrete-event simulators create an extremely detailed, packet-by-packet model of predicted network activity but require extensive calculations to simulate a very brief period. Typical discrete-event simulations can take several hours or even days to complete.

Analytical simulators use mathematical equations to predict network and application performance. These packages sacrifice accuracy to provide faster performance.

IT DecisionGuru uses a hybrid simulation technology combining discrete-event and analytical simulation techniques that lets network managers control the amount of detail provided. Turn up the level of detail, and run-time increases proportionally. Scale it back, and run-time is shortened.

IT DecisionGuru performed extremely well at all levels of detail. With the out-of-the-box settings, most simulations finished in a minute or two on our Sun UltraSparc 2.0. Performance was almost identical on our Windows NT platform. MIL 3 states that the performance of IT DecisionGuru running under



Product: IT DecisionGuru

Vendor: MIL 3

Unmatched accuracy and customization options put MIL 3's IT DecisionGuru ahead of the competition.

Windows NT should be slightly better than the Solaris version, but we saw very little difference.

In our most complex test scenario — an enterprisewide collection of subnets all sending heavy HTTP and File Transfer Protocol traffic across a 10M bit/sec link — IT DecisionGuru took 45 minutes to simulate 1 hour of network activity. This is a good example of its hybrid technology. A pure discrete-event simulator would have taken many hours to process this data, while an analytical tool would have finished in a few minutes.

We compared IT DecisionGuru's performance statistics to results we obtained with Ganymede Software's Chariot 2.0, a network testing and modeling tool (NW, Jan. 25, page 65). We used Chariot 2.0 to provide a benchmark for accuracy assessments. IT DecisionGuru predicted performance of approximately 2.5M bit/sec on a 10M bit/sec link over the course of an hour, a metric that closely matched the Chariot test findings and our historical observations of similar segments of the university network.

A feature unique to IT DecisionGuru — and one that makes it particularly appropriate for organizations with enterprise resource planning programs such as SAP R/3, PeopleSoft and Baan — is MIL 3's Simulation Methodology for Application Response Time Engineering (SMARTe).

Instead of depending on canned application models,

SMARTe lets you profile the exact behavior of an application by capturing packet traces, adding background traffic levels and then investigating what-if scenarios. SMARTe lets you tailor a simulation to reflect your real network, rather than a network that the creators of the program envisioned.

Our runner-up, NetCracker Professional 2.0, is based on an analytical engine. NetCracker performed well on the NT platform but didn't let us choose run-time intervals. While IT DecisionGuru and CACI's Predictor let you select the simulation period in minutes, hours or days, NetCracker runs until you stop it.

This lack of interval selection makes NetCracker less useful to managers who want to model network activity over set periods to predict growth over time. However, NetCracker Technology says it plans to include this feature in future releases of the product.

On our enterprisewide performance test, NetCracker estimated 1.25M bit/sec utilization, which was not as close to actual performance figures as IT DecisionGuru's 2.5M bit/sec estimation. The differing results are most likely the result of the difference between NetCracker's strictly analytical engine and IT DecisionGuru's hybrid engine, and the extremely granular nature of IT DecisionGuru's settings.

Overall, we found NetCracker's reports to be clear and easy to understand; the product's response time on our NT test system was excellent. While not up to the level of IT DecisionGuru in its protocol models and application profiling tools, NetCracker would make an excellent presentation package for sales engineers or network managers making budget presentations.

CACI's Comnet Predictor and Baseline uses a proprietary technology called Flow Decomposition as its underlying engine. Flow Decomposition analyzes network queuing and traffic flow instead of tracking each network event, as would a discrete-event simulator. Avoiding packet-by-packet analysis provides much

ScoreCard

	Accuracy 25%	Performance 25%	Device library 20%	Customizing capabilities 20%	Installation 5%	Documentation 5%	Total score
IT DecisionGuru	10 x .25 = 2.50	10 x .25 = 2.50	10 x .20 = 2.00	10 x .20 = 2.00	9 x .05 = 0.45	10 x .05 = 0.50	9.95
NetCracker Professional 2.0	8 x .25 = 2.00	9 x .25 = 2.25	9 x .20 = 1.80	8 x .20 = 1.60	9 x .05 = 0.45	9 x .05 = 0.45	8.55
Comnet Predictor and Baseline 1.1	8 x .25 = 2.00	9 x .25 = 2.25	9 x .20 = 1.80	7 x .20 = 1.40	9 x .05 = 0.45	9 x .05 = 0.45	8.35
NetRule 2.0	7 x .25 = 1.75	7 x .25 = 1.75	7 x .20 = 1.40	7 x .20 = 1.40	9 x .05 = 0.45	6 x .05 = 0.30	7.05

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score. The World Class award goes to products that score 9.0 or better.

snappier response times. We found that most of our simulations ran in just a few seconds on our 400-MHz Pentium PC.

Comnet Predictor and Baseline's performance reports were very clear, making it easy to find the areas of the network that had the potential to be oversubscribed. The reports were also accurate, falling within a few percentage points of what we expected to find based on our Chariot testing and historical records. This result was particularly impressive given the short time it took Predictor to perform the calculations.

We were also impressed with Predictor's easy tuning features that let you tweak settings to try different scenarios.

A step below the other three packages, Analytical Engine's NetRule 2.0 is a basic, entry-level product. Analytical Engine considers NetRule to be a modeling package and notes that simulation is just one of many techniques for modeling a network's performance. The company's intent is to provide an easy-to-use product with an uncomplicated interface.

In fact, NetRule simplifies device models to the extent that we were concerned about its accuracy. NetRule provides various computer models, such as a file server, generic server, Internet server and 200-MHz Pentium PC, but all start with the same device attributes. Company representatives say it's the user's responsibility to properly tune each device to reflect its true performance characteristics. We found this to be disconcerting for a product that's aimed at novice modeling and simulation users. Performance estimates can be flawed from the beginning if a user fails to properly tune each device, leading to inconsistent predicted and actual results.

On the plus side, NetRule's cross-platform portability is a useful feature. Because it is implemented in Java, NetRule runs on a variety of platforms without a problem.

More Online

- How we did it.
- Our review of network diagramming tools.
- Links to MIL 3's IT DecisionGuru introductory Web conferences.

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Customization counts

All the programs we tested offer a reasonable selection of network devices and protocols for building network models; the ability to customize these components is where the products showed their differences.

IT DecisionGuru, clearly the leader in this area, lets users create "derived models" by modifying the attributes of an existing node or link model. If the router you're trying to model isn't included in the supplied libraries, you can simply pick the best approximation and change the attributes. In addition, MIL 3 stores a large collection of user-created derived models on its Web site.

What's missing from IT DecisionGuru is the ability to create an entirely new device or protocol from scratch. For this task, you need to purchase MIL 3's OPNET Planner, which lets you create, edit and save custom models. However, MIL 3's device library is excellent and, when coupled with the free customer-derived models, should be enough for average users to design a corporate network.

NetCracker Technology provides the second-best customization options. You can't control as many device attributes as you can with IT DecisionGuru, but NetCracker's wide selection of network devices and

Net Results



IT DecisionGuru

MIL 3

(202) 364-4700

www.mil3.com/products/itdg/home.html

\$19,000 for a single-seat license

Pros

- ▲ Detailed device and protocol models
- ▲ Good performance
- ▲ Easily customized
- ▲ Superb reporting features

Cons

- ▼ Quirky license manager
- ▼ Highly detailed simulations run slowly

NetCracker Professional 2.0

NetCracker Technology

(800) 477-5785

www.netcracker.com

\$9,995 for a single-seat license

Pros

- ▲ Good performance
- ▲ Nice animation
- ▲ Good library
- ▲ Good technical support

Cons

- ▼ Lacks timed simulation runs
- ▼ Not as accurate as IT DecisionGuru

Comnet Predictor and Baseline 1.1

CACI

(619) 824-5200

www.caciasl.com/predictor/

\$24,500 for a single-seat license

Pros

- ▲ Easy installation
- ▲ Fast performance
- ▲ Friendly reports

Cons

- ▼ High price
- ▼ Outdated look and feel

NetRule 2.0

Analytical Engines

(703) 847-6858

www.netrule.com

\$2,500 for a single-seat license until Sept. 1, \$7,500 thereafter

Pros

- ▲ Multiplatform portability
- ▲ Easy to use out of the box
- ▲ Inexpensive

Cons

- ▼ Too simplistic
- ▼ Low-end graphics
- ▼ Steady state analysis not true simulation

configuration options makes this a secondary concern.

Configuring devices with NetCracker was awkward at first, but we learned to appreciate its unique approach. For example, if you're adding a router to a design, NetCracker first creates the router without any interfaces for you to place in the diagram. Then you have to drag and drop the appropriate interfaces on top of the empty router. Once we got used to this approach, we found it easy and flexible.

Designing our test network with CACI's Comnet Predictor and Baseline was a bit challenging because the program first makes you choose a generic model for each device, such as "network node." Once you've copied a base object to the new diagram, you can select from a range of products. The finished model works well, but it looks a bit less polished than the other packages.

Comnet Predictor and Baseline's library includes a good selection of devices, from the 3Com Core-Builder 3500 to the Zynx ZX318 server switch. You can modify some of the attributes, such as supported protocols and packet rate per protocol. Like NetCracker, Comnet Predictor and Baseline doesn't allow you to set as many parameters as IT DecisionGuru, but we thought its options were sufficient for most users.

Comnet Predictor and Baseline, like MIL 3's IT DecisionGuru, is based on an existing high-end simulation package. CACI's Comnet III discrete-event simulator is the parent product, targeted at hardware engineers designing new products. Users can import models generated by Comnet Predictor and Baseline directly into Comnet III for a more detailed analysis.

Analytical Engine's NetRule includes a basic set of network devices. But we found the settings for very different devices to be too similar, as noted above. NetRule does provide a variety of modifiable attributes, and once a device is properly configured, you can store the newly created device model in a library file. With enough time, a user could probably build a library of devices that accurately reflects a given network.

Getting started

All the products installed easily, though we did experience a few minor hang-ups. For example, NetCracker reported that it had expired immediately after we installed it. A quick call to technical support got us a new CD-ROM and license key, which solved

the problem.

IT DecisionGuru's license server caused a few problems. We originally installed the software on an NT platform and registered it through MIL 3's Web page without any trouble.

But when it came time to install the product on our UltraSparc, we found that it would take many steps to unregister the original installation and then re-register the UltraSparc. We elected to leave the license server on the NT machine and run the client on the UltraSparc. Unfortunately, we had moved the NT box to a different Class B network, and when we did, the license server wouldn't operate. MIL 3 confirmed that the license server must remain on the same network subnet. This is a potential problem for large corporations or universities.

In the field, all the products we tested provided useful results, and all have distinguishing features. Based on its combination of features, performance, technical support, documentation and customization capabilities, MIL 3's IT DecisionGuru is our top choice. If you want the Ferrari of simulators, this is the product to purchase.

Currier is director of data communications at Duke University in Durham, N.C., and the 1998 Grand Prize winner in the Excellence in Campus Networking competition sponsored by CAUSE, a user group for computer professionals in higher education. He can be reached at robert.currier@duke.edu.

NetworkWorld

TEST ALLIANCE

Currier is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.





Cool Tools

Quick takes
on high-tech toys



Lee Schlesinger, Test
Center director

WIRELESS SYMPHONY HUMS ALONG

I've been going to the Symphony every night recently, and it's music to my ears. No, I'm not talking about my new stereo receiver; I'm referring to Proxim's Symphony cordless network products. They're the best option I've seen for networking home computers.

"CoolTools" fans will remember that I've been exploring options for connecting clients in my home network. Last year, I tried Intelogis' PassPort, which runs over home power lines (NW, October 12, 1998, page 50). It had a troublesome setup and sluggish throughput.

In March, I tested ActionTec's ActionLink, which runs over home telephone wiring (NW, March 1, page 46). At about 120K bit/sec, its throughput was better but not glowingly so.

This week, Proxim's Symphony picked up the baton. The product line includes a PC Card adapter, ISA adapter and cordless modem. Proxim says a PCI adapter will be available this summer.

Installing the adapters is easy, and configuring them is simple. You use password as a security code, so you can have multiple Symphony subnets in one area while maintaining the privacy of each subnet's transmissions.

Despite the simplicity of the installation, Symphony doesn't stint on performance. The products are rated at 1.6M bit/sec — but nothing performs at its rated speed.

I was able to get a 2.4M-byte file via

File Transfer Protocol from one client to another at a speed of 520K bit/sec. That's better than four times the speed of ActionLink and approaching effective Ethernet territory.

With the other home network products I tried, more problems turned up the longer I used them, especially in keeping them connected and getting

reasonable throughput. But that was not so with the Symphony offerings. Weeks after installation they're performing as well as they did on Day 1.

I was going to dub the network niche that Symphony falls into the home area network, or HAN, but I find I've been beaten to it. That was by the authors of *The Complete Idiot's Guide*

to *Networking Your Home*, just out from QUE this month, which covers everything you need to know about connecting PCs together outside the office, with wiring or without.

Find a link to the networking guide on Network World Fusion (Doc Finder: 3022), and a fine tutorial on networking your home computers. ▣

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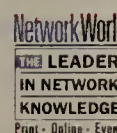
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Pushing off paperwork

Umbrella service organizations handle administrative tasks for IT consultants.

BY TOM DUFFY

Mike Taht has been an independent network consultant for 10 years. While Taht is good at what he does, he has never been very good at paperwork. Consequently, there were more than a few times when he simply forgot to get paid.

"I would space out and I wouldn't bill for a month or two," says San Francisco-based Taht. "I'd go from caviar to peanut butter sandwiches once a month."

Then Taht discovered Contractor's Resources, Inc., one of a handful of so-called umbrella service organizations that let contractors retain the benefits of independence while also giving them some of the advantages of full-time employment.

For a 4% cut of his fee, Contractor's Resources in Iselin, N.J., offers billing services, a 401(k) plan, general liability insurance, access to group health insurance and a host of other employee benefits. At the same time, the arrangement allows Taht to take advantage of his status as an independent contractor, which means he can write off business expenses such as travel and equipment costs.

There are only a handful of such companies around the country; in all, the firms have perhaps 1,000 contractors aligned with them. In addition to Contractor's Resources, there is Churchill Benefits in Delray Beach, Fla.; Independent Professional Services, Inc. in Flemington, N.J.; and Professional Association of Contract Employees (PACE) in Walnut Creek, Calif.

Umbrella service organizations say their companies offer an appealing alternative to the expense of establishing an independent corporation. Instead of hiring an attorney to incorporate the business and sorting through the complexities of such things as liability insurance, contractors can simply pick up the phone.

"This offers hassle-free payroll, accounting and expense reimbursement," says Jim Ziegler, executive director of PACE.

Unlike temporary agencies, which actively search for work on behalf of contractors and hire contractors out to firms, umbrella service organizations provide only limited help in locating job opportunities. For that reason, they primarily target their services at contractors who have a proven ability to find work for themselves — people like Dan Beveridge.

In 1997, Beveridge was working on a contract basis as a network manager for a New Jersey-based telecom giant through an agency that took a 40% cut of his

pay. He was reluctant to establish his own corporation.

But he also wanted to make more money, so he signed on with Contractor's Resources and hasn't looked back.

"My representative checks up on invoices and makes sure things move along in a timely way," Beveridge says. "The drawback would be that if my current position ends, I'm not going to have the assurance of some company actively looking for a position for me."

Yet umbrella service organizations aren't just for individuals.

"We have a guy who has 10 or 12 employees," says Karina Ukstins, account manager at Churchill Benefits. "But he funnels everyone through us because he'd rather concentrate on making placements and recruiting for his own company than running the human resource side."

If you're an independent contractor who's thinking about handing the paperwork over to an umbrella service organization, it's important to comparison shop. While some charge a percentage fee, others, such as Churchill, levy a flat fee. The organizations offer different health benefits and 401(k) plans.

If all of this sounds too good to be true, some critics of umbrella organizations say it might be.

Janet Ruhl, the author of *Answers for Computer Contractors*, says running your expenses through an umbrella service organization you don't actually work for might invite a tax audit.

"It's very funky," Ruhl says. "I wonder if you started having thousands of people doing this whether the IRS might take another look."



Now that an umbrella service organization handles billing for independent contractor Mike Taht, he has more time to spend on his music and other hobbies.

But the umbrella service organizations counter that their operations are no different from consulting firms or temporary agencies. Besides, they say, if the IRS were to question the practice, the liability for taxes would fall to the service organizations, not to the individual contractors.

Alex Libkind, vice president of Contractor's Resources, says the IRS didn't raise any questions about the status of his company's contractors during a 1996 audit.

Still, the umbrella service organizations acknowledge they aren't for everyone. Contractors who have not developed a cash reserve might want to delay joining. Their cash flow might be temporarily interrupted because the firm doesn't pay contractors until their clients forward the funds.

Contractors who are already proficient at bookkeeping may see little need for these services, but Taht suggests that freeing yourself of the paperwork gives you more time to focus on your IT talents and make money.

If nothing else, that at least means Taht's diet has improved.

"I still like PB and J," he says. "But now sometimes I have it with a nice glass of red wine."

Duffy is a freelance writer in Northampton, Mass. He can be reached at tduffy62@compuserve.com.

More
Online

- Information about umbrella service organizations.
- Tips for doing business as an independent contractor.

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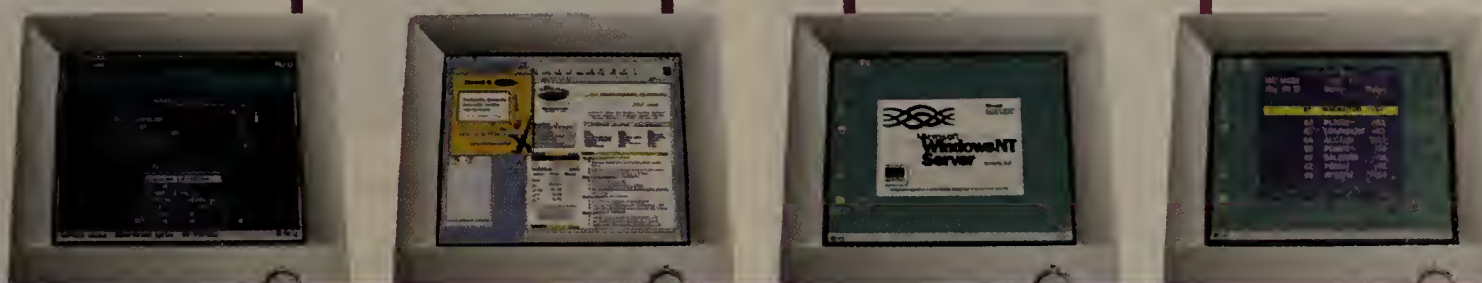
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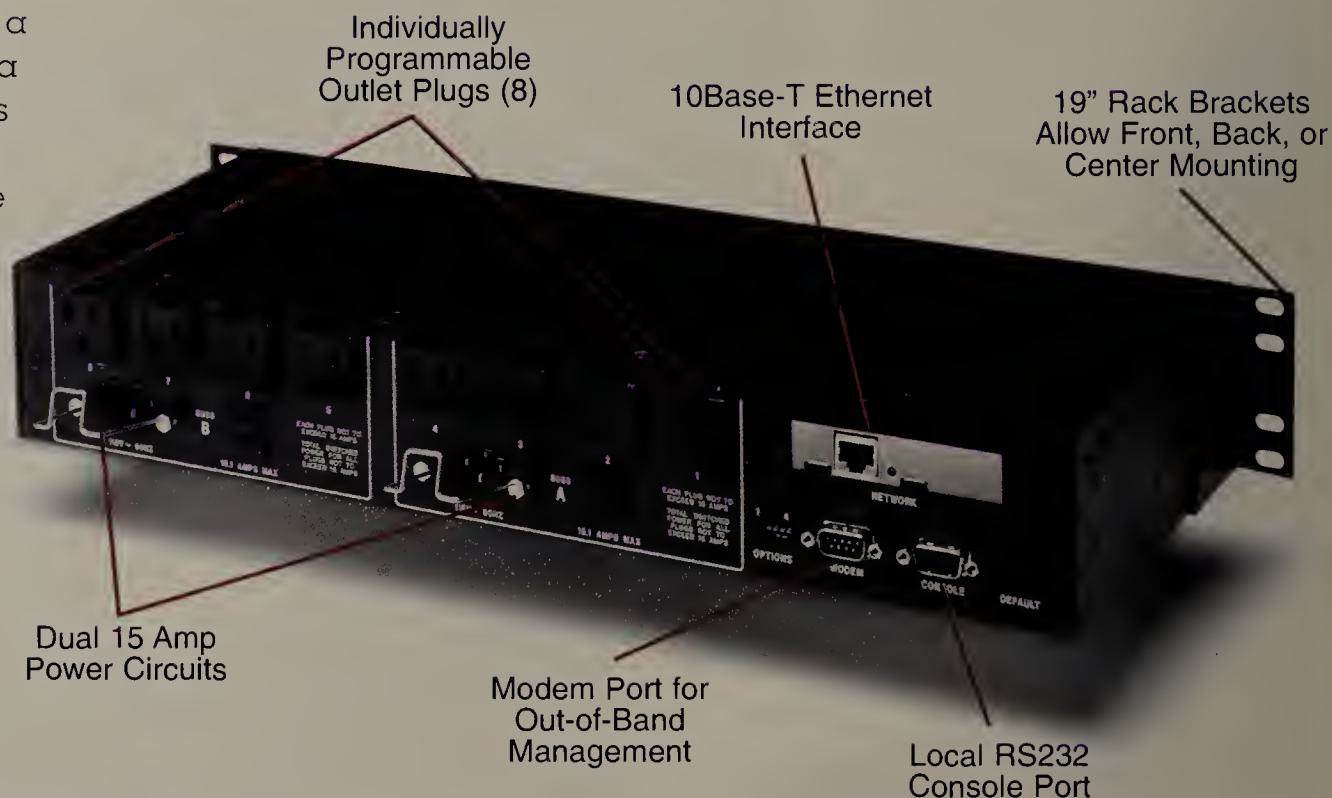
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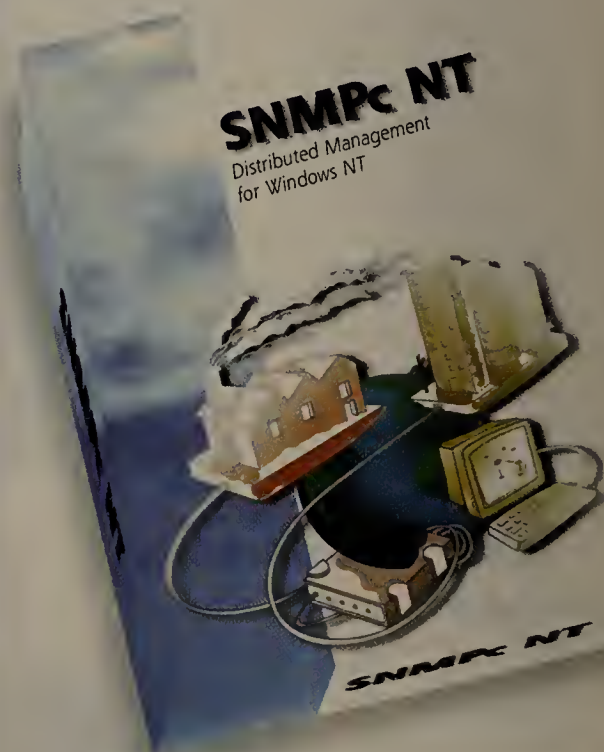


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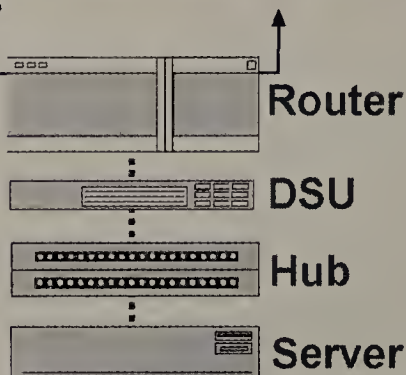
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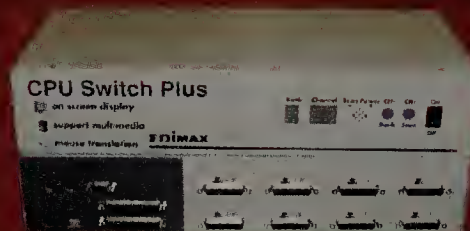
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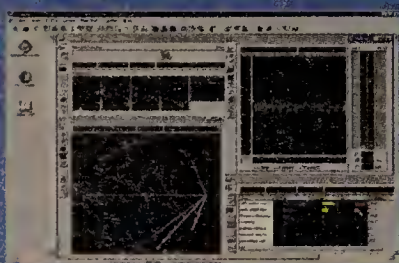
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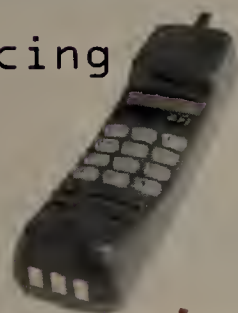
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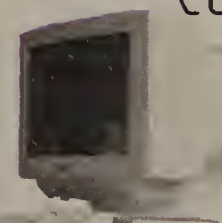
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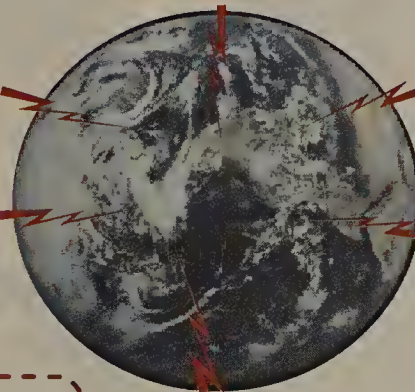
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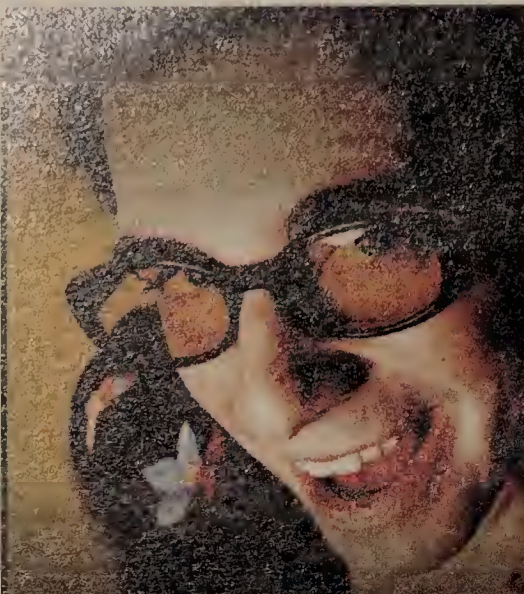
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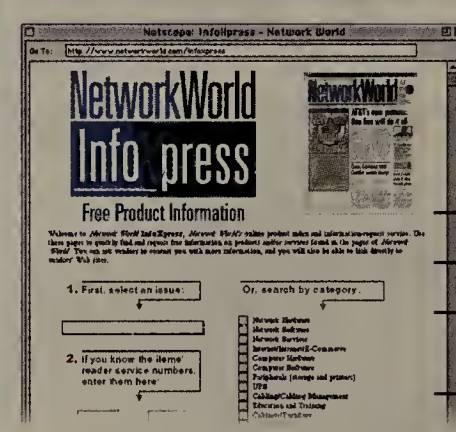
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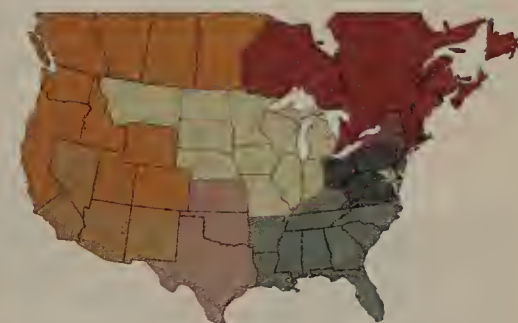
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Stars,
continued from page 1

which will pursue you from page to page with a lust of its own.

Viagra? "Yes, we're selling Viagra online," acknowledges Warshavsky, the twentysomething bad boy of porn, whose big-busted empire, the Internet Entertainment Group (IEG), is making money hand over fist.

Warshavsky thinks Viagra, the cure for male impotence, is an obvious cross-sell for porn, and why not? Now you can buy this prescription medicine online through another Web business, IEG Medical Services.

For Warshavsky, president and CEO of IEG, the secret to success is to try anything. Move aggressively to fortify your brand and use the latest Web technologies to deliver the most, well — stimulating experience.

After all, catering to mankind's baser instincts isn't as easy as it sounds. Internet porn has become a tough, competitive business. But by trying every publicity gimmick possible — from acquiring the sex video of Pamela Anderson and Tommy Lee to distributing nude photos of Dr. Laura Schlessinger — IEG has turned its main Web site, clublove.com, into a money machine.

Responsible for most of IEG's \$15 million profit last

year, clublove.com takes in the bulk of its revenue from subscribers paying \$24.95 per month for the pleasure of trolling a mind-boggling multiplex of sex.

Milking the clublove.com cash cow, the restless Warshavsky has diversified into gambling at goldenoasis.com; psychic advice at psychic.com; real-estate investment at zerodown.com; a place to watch surgery online at surgeryonline.com; and naturemed.com, which sells herbal remedies.

Whether IEG ventures will pan out in the long run is unclear, but Warshavsky is clearly a believer in the idea that you don't know until you try. Uncommonly savvy about networks and software, he also moves aggressively to deploy technology to boost his business.

For instance, IEG developed its own fraud-control database to weed out bad credit cards. It developed its own "push" video and broadcast technology to blast out pictures of women and allow enraptured viewers to engage in an interactive relationship — without having to download a plug-in. "The important thing is ease of use for the end user," Warshavsky advises.

The IEG CEO's main goal this spring is to take the company public in an initial public offering, and he dismisses any of the gossip that says the big

Wall St. investment firms won't put their bucks into a Web porn site.

eBay: Know your customer

At eBay the secret to success is: Know your customer. And what a success it has been. This online person-to-person auction house handles an astounding 400,000 auctions per day, selling everything from dolls to cars.

To understand the eBay auction bidder, who registers by name and typically spends 1 1/2 hours online there each month, eBay looks back. The company regularly reviews the history of its online transactions since the company was launched over three years ago.

"We have all the data from the beginning of time, and we use it extensively for analysis purposes," says Michael Wilson, eBay's senior vice president of engineering, who oversees the technical operations at the auction house.

Based on this analysis of user demand, eBay makes changes in its auction services. For instance, when eBay noticed that growing numbers of bidders hailed from Japan and Australia, it decided to launch versions of its auction service in those areas. And with people registered in over 90 countries, eBay realized early on that it had to provide a central repository of international tariffs, customs and regulations.

Customer analysis also changes the product mix, with eBay adding new categories as interest in different types of collectibles grows. The number of categories is now up to 1,000.

Although eBay's auction enthusiasts appear at first glance to be on the cutting edge, they are actually unsophisticated in terms of the technology itself, Wilson says. Therefore, eBay's Web site is kept simple, so that even the least 'Net-savvy individual can just jump in and use it.

"We don't set a cookie, because our users don't understand them," Wilson notes, adding, "Besides, it feels icky to track people about what they're doing." And because eBay's online bidders are not keen on banner ads unrelated to the auctions, eBay rejects commercial advertising.

All of this doesn't mean eBay runs an unsophisticated back-room operation. According to Wilson, eBay has "overbuilt" by installing four Sun Starfire servers "so we can take 50% more traffic than we receive." And a technical staff of 72 is needed to keep all those auctions going.

Travelocity: Keep it simple

In the high-flying market for online travel sales, it has been a close race between Travelocity and Expedia, both launched three years ago.

With revenue last year of

\$285 million, Travelocity, a subsidiary of The Sabre Group Holdings, just managed to edge out Expedia, a Microsoft venture. Expedia, however, claims its current run rate is higher than Travelocity's.

According to Travelocity's top executive, Terrell Jones, the secret to success has been focusing on ease of use for online buyers.

"What we found is, the faster the site works, the shorter the path, the more people purchase," says Jones, who is senior vice president of Sabre Interactive and chief information officer at The Sabre Group. "When Travelocity first went live, it took the online buyer a total of 13 screens to make a booking. Now, that's been reduced to just three," he says.

The Sabre Group also produces the Sabre electronic booking system widely used by travel agents and airlines. Travelocity, also based on Sabre, confronts the problem of cutting out the travel agent by giving agents commissions if online buyers opt to have their tickets issued through the agents. In addition, Travelocity is putting up Web sites for travel agents. "We've built 12,000 Web sites for our agents," Jones says. "Most are simple, but some are complicated, such as cheaptickets.com."

With its competitor Expedia emphasizing low-cost fares, Travelocity recently struck back

Secrets of the EC stars

EC star: IEG

IEG's secret:
Try anything



"Yes, we're selling Viagra online."

Seth Warshavsky, president and CEO, Internet Entertainment Group

EC star: eBay

eBay's secret:
Know your customer



"We have all the data from the beginning of time, and we use it extensively for analysis purposes."

Michael Wilson, senior vice president of engineering, eBay

EC star: Travelocity

Travelocity's secret:
Keep it simple



"What we found is, the faster the site works, the shorter the path, the more people purchase."

Terrell Jones, chief information officer, The Sabre Group, which owns Travelocity, and senior vice president of Sabre Interactive

EC star: Expedia

Expedia's secret:
Focus on ease of use

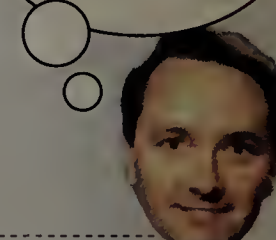


"In the early days ... we were content-rich, but we made it hard for customers to find out how to buy a ticket."

Simon Breakwell, group manager, travel business unit, Expedia

EC star: Cisco

Cisco's secret:
Integrate ERP



"By connecting the Web and the ERP system, the customer can submit an order and 15 minutes later pull up the status."

Todd Elizalde, director of Internet commerce, Cisco

A sampling of advice and ideas from some of the top minds in electronic commerce.

with a new Web feature called "Best Fare Finder." This feature tells customers when a ticket will be less expensive if they're willing to fly at a different day or time.

Expedia is overtaking Travelocity right now, claims Simon Breakwell, Expedia's group manager for the travel business unit, noting Expedia is now doing \$15 million in bookings per week, vs. Travelocity's \$11 million.

Breakwell, too, says the secret to success has been focusing on the Web site's ease of use.

But for Expedia, the problem has been to come up with the right mix of travel information content.

In the past, travel buyers at expedia.com could barely find their way past the exotic travel descriptions of Tahiti or the Andes and get to a place where they could actually buy tickets.

"In the early days, we spent a lot of time thinking about Expedia as a place to find out about the world," Breakwell says. "We were content-rich, but we made it hard for customers to find out how to buy a ticket."

Now, Expedia makes sure you can purchase travel tickets directly off the home page instead of searching for a screen buried underneath content.

Cisco: Integrate ERP

By now nearly everyone has heard Cisco's amazing elec-

tronic commerce success story. The hardware heavyweight now gets 75% of its total equipment orders through its Web site; that's 2,000 purchase orders for a total of \$23 million worth of business each day.

The secret of Cisco's success, according to Todd Elizalde, the firm's director of Internet commerce, is making sure Web-based ordering is smoothly integrated into back-end enterprise resource planning (ERP) systems.

"This is one of the crown jewels of our system," Elizalde says. "By connecting the Web and the ERP system, the customer can submit an order and 15 minutes later pull up the status."

When the company began using the Web for business transactions almost three years ago, Cisco hooked cisco.com into its in-house Oracle ERP system. From the beginning, every order went directly into the order-management process without having to be keyed in again.

This not only saves considerable time, it also promotes the accuracy of the order.

Accuracy is also safeguarded by the Web site's "configuration engine," based on a product from Internet Commerce Connection. The engine looks over the order to spot commonly found errors.

The Web engine automatically checks customer account

information and purchase details against a database of technical information. For example, if a part number is wrong, the engine will flag it. And the engine won't let you order a version of software that is inappropriate for your hardware.

This process "makes it almost impossible to submit a wrong configuration," Elizalde claims. In contrast, with faxed orders, one-third of the time Cisco has to call the customer back to discuss an error.

The ERP hooks are a boon to Cisco's largest reseller partners, who want to have the order information entered directly into their own ERP systems at the same time they send it to Cisco.

Dell: Customizing for users

Dell might not sell 75% of its gear over the Internet like Cisco does, but it moves quite a bit of merchandise. Dell does \$14 million per day in direct sales of 30,000 products, and the Web now accounts for 25% of the company's total business. The rest is mostly done over the phone.

But Dell doesn't have one monolithic Web site. Instead there are three separate Web sites serving different lines of business and different constituencies.

According to Richard Owen, vice president of marketing at Dell Online Worldwide, having a different Web strategy for each customer base is the secret to keeping the firm's online business on track.

"Dell is a company that continues to grow rapidly, and the Web is intrinsic to our growth," he says, adding that "70% of our sales are to business, 30% are to consumers."

For consumers and small businesses, Dell has a Web site, dell.com, where the public can place orders via a credit card.

For 15,000 larger corporate customers, there is a password-based extranet Web server called Premium Pages. Ford Motor Co. and Boeing are Premium Pages customers.

"The specific prices [on Premium Pages] are the ones that your company has negotiated," Owen says.

To place an order on the Premium Pages site, a customer logs into Dell's own intranet in Austin, Texas, or other data centers around the world, including facilities in Ireland and

Tokyo.

Dell's third Web site, called gigabuy.com, was launched last month to sell software and peripherals to both consumers and business customers. The content on gigabuy.com will probably be folded into Premium Pages, Owen says.

Promoting its public Web sites means spending a lot of money on advertising, and Dell does that through traditional means, such as print and television, as well as Web advertising. Banner ads on the Web don't seem to be too effective, Owen comments.

Just last month Dell took a different approach to advertising through what it calls its affiliate program. In this program, other Web sites sign up to drive traffic to Dell, which will pay a commission for the actual business generated in this way. Amazon.com is one of the first affiliates Dell has signed up.

Disney: Manage centrally

Entertainment colossus Walt Disney Co. is proving that an old-line, established business can successfully adapt to the Web. In Disney's case, the secret to success has been centralizing management over a far-flung Internet empire.

Disney jumped enthusiastically onto the Web more than three years ago with Disney.com, followed soon after by ESPN.com and ABCnews.com. While these did fairly well as stand-alone sites, Disney saw them as being too isolated.

These days, the three flagship Web sites are managed under an entirely new unit set up a year and a half ago called the Buena Vista Internet

Group. Buena Vista directed Starwave, the Web technology company it bought, to centrally coordinate content for the flagship Disney sites.

And Buena Vista this January launched the GO Network (www.go.com) as Disney's own Internet portal, the door to all the Disney Web sites — as well as a pointer to new content not traditionally associated with Disney, such as financial services.

So far, the strategy seems to be working, says Geoff Riess, senior vice president of programming and development at ESPN Internet Ventures.

"Disney's acquisition of Starwave gave us a stronger technology edge and electronic commerce expertise," Riess claims.

Starwave, for example, helps make sure that Web visitors will see sports merchandise linked to the leading sports stories of the day. "We've learned a lot over the last six months to increase the numbers of items we're selling," Riess says.

Starwave takes care of database management for all of Disney's Web ventures and can centrally coordinate the promotion of events across them all. Though building a Web presence is tough, Disney Online, a site for children and their families, now has 190,000 paying subscribers and gets 900,000 visits per day. The online Disney store each day sells as much as eight of the brick-and-mortar Disney stores. Even Donald Duck wouldn't complain about that. ■

EC star: Dell Computer

Dell's secret:
Have a different Web site for different customer bases

"Dell is a company that continues to grow rapidly, and the Web is intrinsic to our growth."

Richard Owen, vice president of marketing, Dell



EC star: Walt Disney Co.

Disney's secret:
Manage centrally

"We've learned a lot over the last six months to increase the numbers of items we're selling."

Geoff Riess, senior vice president of programming and development, ESPN Internet Ventures, a subsidiary of Disney

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Give me a net-enabled dog groomer

We have two dogs: A black Lab (Sammi) and a Golden Retriever (Casey), and it amazes me that they aren't bald. They get washed every other week and Casey, who is a lot hairier than Sammi, gets brushed at least once a day.

Despite their grooming, we still seem to be forever battling enormous dust bunnies made of dog hair. What we need is a robot vacuum cleaner — something that pops out when we're out or asleep and fights the good fight.

So I was excited when I saw some time ago that Electrolux (www.electrolux.com) had developed a prototype vacuumoid. Looking like an oversized curling stone, it appeared that the device might be the kind of thing I have dreamed of.



MARK
GIBBS

But although it was previously displayed on the company's Web site, now there's nothing there. It is as if the product never existed. But if you go to Altavista (www.altavista.com) and search for "electrolux robot vacuum cleaner" one of the items returned should be "Electrolux presents the robotic vacuum cleaner" so I'm not dreaming.

If you look around, you'll find many firms with robot vacuum cleaners, although Electrolux's appeared to be the most commercial attempt I've seen.

This high-teching of household appliances is an interesting area. We have even seen bleeding-edge technologies, such as fuzzy logic, show up in rice cookers (<http://zozjirushi.com/rice.html>) and toasters (http://www.aafes.com/Hot_Product/tstrs.htm).

<digression>From the Gibbs Archives: *If Microsoft made toasters, you would have to buy a new toaster every time you bought a loaf of bread. You wouldn't have to take the toaster if you already had another one, but you'd still have to pay for it. Toaster 95 would weigh 15,000 pounds, require a reinforced steel countertop, draw enough electricity to power a small city, take up 95% of the space in your kitchen*

and claim to be the first toaster that lets you control how light or dark you want your toast to be. Everyone would hate Microsoft toasters, but would nonetheless buy them because most of the good bread only works with their toasters. — Anon</digression>

Now we have the Web applied to refrigerators! If you search the 'Net you'll find that Electrolux and Frigidaire (a brand of Electrolux) are associated with something called the Screen Fridge. Announced last year, the Screen Fridge is really just a Windows PC stuck on the front of a refrigerator running a browser, an Internet connection and a barcode reader.

<digression>The PC side of the fridge makes me wonder whether we'll soon be hearing people say: "Darn it, my fridge crashed last night when I was installing a service pack and every time I open the door it GPFs and locks the vegetable crisper."</digression>

So why would you want a Web-enabled fridge? Well, as the refrigerator is the center of gravity of most households (especially those with teenagers), it is a good place to have a notice board and access to things such as recipe databases.

The purpose of the barcode reader is to scan foods as you put them in the fridge so that you have an ongoing shopping list. Hmm. I asked my lovely wife what she thought of this feature and her response was that it wouldn't work — too much fiddling around and too techie for most people. I couldn't agree more. The Screen Fridge sounds a little lame.

But the idea of appliances such as fridges, furnaces, water softeners and just about anything electrical being connected to the 'Net is great. I've been saying for years that this is an incredible opportunity and that it is going to happen.

The technologies that will make this prediction a reality are already appearing: Power line home networking, smart appliances and a consumer Internet.

Next week: When your fridge talks to you. For now, I need to go and ponder whether it would just be easier to wash the dogs in Nair.

Grooming tips to nwcolhmn@gibbs.com.

A funny thing happens when you write a column like this and include an unbearably amusing tag line at the bottom inviting readers to weigh in with their thoughts.

People actually write in. And because reader participation is an activity we encourage here at *Network World*, today's column will be devoted to a sampling of that correspondence. . . . Just goes to prove once again that no good deed goes unpunished.

My first column three months ago took a look at so-called "typo Web sites," URLs that are intentionally misspelled by their owners — pornographers, mostly — so they approximate famous 'Net addresses. The idea is to generate traffic off the good names of others.

"I just red yer furst column abowt tipos on the Innetnet," writes Paul Ames, a systems analyst with the New York Suffolk County Health Department. "Dusn't erverbudy just use a serch engine and click on wat they want? Who kin spel or tipe these daze?"

Another reader points out that the typo scam is by no means limited to the 'Net. "Remember 1-800-operator, the AT&T collect calling number?" asks Jim Tauber, a manager at Strategic Outsourcing in Charlotte, N.C. "Another long-distance carrier took the five most popular misspellings of operator, added the 1-800 and had them directed to their operators. Paid off big."

In other words, if there's a buck, there's a way.

An item about evolving Internet lingo prompted this suggestion from Bill Bach, president of Goldstar Software in Westmont, Ill.

"I've looked but have never seen the term 'entrepreneur' used outside of my own writing," Bach says. "This term refers to a geek who capitalizes on his [or, to be politically correct, her] expertise by starting up a new business."

Speaking of political correctness, Buzz has been accused of straying outside the boundaries. A column about research on "the new Internet user" spurred one reader to see a connection between these two phrases I wrote: "more often than not, he is a she," and, "in other words, expect every putz on the planet to be wired soon."

There were more words between those excerpts, but apparently not enough of them to keep the letter writer from connecting the dots.

"I certainly hope you were not intending to offend half of the world's population," she huffs. "Being female does not make me a putz."

Nor does being female make a person see insult where none exists. That can happen to men, too.

Every once in awhile a column elicits exactly the desired effect. Such was the case with this reaction to a blurb about a New York start-up's plan to sell "Webmercials" that surfers would watch while downloading content they wanted.

"When I read the opening part about the waitress asking you to watch a commercial before taking your lunch order, I didn't even question its truth," writes Thomas O'Hearn. "It's really frightening how much we've been conditioned to accept advertising EVERYWHERE."

A writer never knows what will prompt a reader to respond. Sometimes it's just a single phrase. "I had not seen the 'Artist Formerly Known as Netscape' before, and I love it," writes Don Tobin, a computer security researcher at the University of Idaho. "Nice coinage, depicting Netscape's rape by AOL, then Sun."

Rape? I was just going for the quick giggle. Readers also found fault with me for: using the term "geezer golf" to poke fun at Novell's sponsorship of a "seniors" professional tournament; labeling people who eat road kill "local loonies" (go figure); and settling for the cheap laugh at the expense of poor, beleaguered Dennis Rodman.

I'll plead guilty to the last charge.

Want to be in the next "letters" column? Contact Buzz at (508) 820-7471 or pmcnamara@nww.com.



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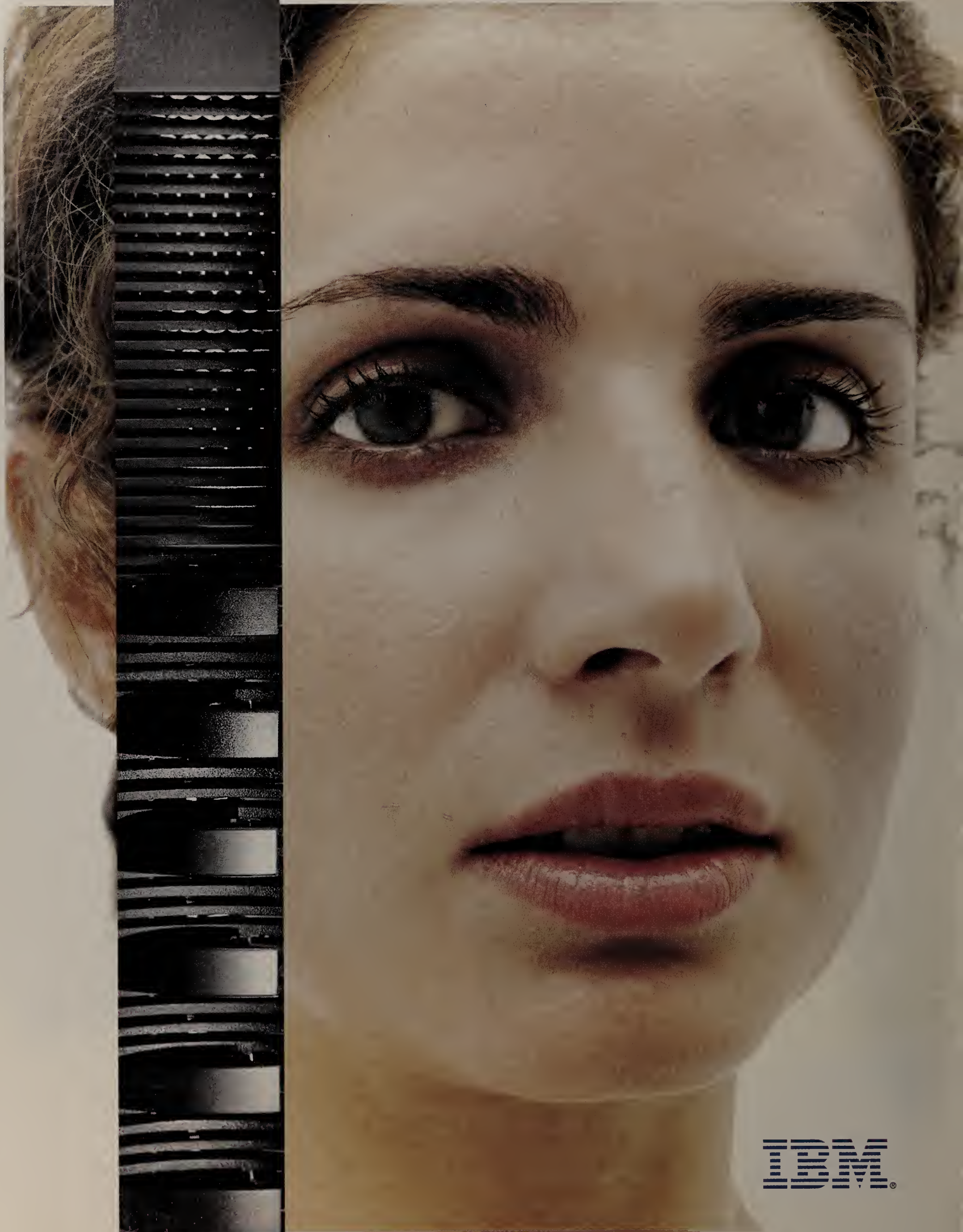
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